Board of Regents
Committee on Education Policy and Student Life

Friday, March 6, 2020
9:30 a.m.

University of Maryland Global Campus
College Park Marriott Hotel & Conference Center
3501 University Boulevard East ~ Hyattsville, MD 20783
Conference Room 1105

Action Items

1. New Academic Program Proposals
   a. University of Maryland, College Park
      i. Bachelor of Science in Biocomputational Engineering
      ii. Master of Arts in International Relations
      iii. Master of Science in Applied Political Analytics

Information Items

2. Update: P-20 Initiatives

3. Update on the USM New Student Enrollment Pipeline and Aggregate Student Success; USM-Wide Student Success Initiatives

4. Crisis Management and Enterprise Risk Management in the USM

Action Item

5. Motion to Adjourn
**TOPIC:** University of Maryland, College Park: Bachelor of Science in Biocomputational Engineering

**COMMITTEE:** Education Policy and Student Life

**DATE OF COMMITTEE MEETING:** Friday, March 6, 2020

**SUMMARY:** The University of Maryland, College Park (UMD) proposes to establish a Bachelor of Science in Biocomputational Engineering. The program will produce graduates with a foundation in bioengineering and quantitative data science, either for employment or for pursuing advanced degree programs. Biocomputational engineering brings together the field of bioengineering, a discipline grounded in the fundamentals of physics, chemistry, and biology, with computation and data science, which enhances the value of all fields. The objective of the biocomputational engineering program is to provide a breadth of fundamentals in biology and quantitative problem solving while developing skills in computation and data science. Skills such as modeling complex biological systems and the analysis of complex biological data sets can lead to the creation of new knowledge, from the molecular to the organ to the system levels, as well as the development of innovative processes for the prevention, diagnosis, and treatment of disease.

This program will be offered at the Universities at Shady Grove and is mainly intended for students who have completed an associate’s degree from a Maryland public community college. The program will allow them to complete their baccalaureate degree in two years.

The program will offer courses at the 300- and 400-level, which constitute the junior and senior years of the program. The curriculum will require 48 credits of core courses and 12 credits of program-specific electives.

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

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

**CHANCELLOR’S RECOMMENDATION:** That the Committee on Education Policy and Student Life recommend that the Board of Regents approve the proposal from the University of Maryland, College Park to offer the Bachelor of Science in Biocomputational Engineering.

**COMMITTEE RECOMMENDATION:**

**DATE:**

**BOARD ACTION:**

**DATE:**

**SUBMITTED BY:** Joann A. Boughman 301-445-1992 jboughman@usmd.edu
February 3, 2020

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 Bachelor of Science program in Biocomputational Engineering. 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,

Wallace D. Loh
President

MDC
cc: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs
    Mary Ann Rankin, Senior Vice President and Provost
    Darryll Pines, Dean, A. James Clark School of Engineering
UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

x New Instructional Program

Substantial Expansion/Major Modification

Cooperative Degree Program

Within Existing Resources, or

Requiring New Resources

University of Maryland, College Park
Institution Submitting Proposal

Biocomputational Engineering
Title of Proposed Program

Bachelor of Science
Award to be Offered

Fall 2021
Projected Implementation Date

090500
Proposed HEGIS Code

14.4501
Proposed CIP Code

Fischell Department of Bioengineering
Department in which program will be located

Ian White
Department Contact

301-405-6230
Contact Phone Number

ianwhite@umd.edu
Contact E-Mail Address

February 3, 2020
Date

Signature of President or Designee
A. Centrality to the University’s Mission and Planning Priorities

Description. The fields of Biomedical Engineering and Bioengineering are impacting our society by delivering new imaging and diagnostics technologies, new therapeutic delivery methods, and the possibility of new methods for the repair or construction of tissues and organs. At the same time, computational methods and data science are perfusing into every field of engineering, as well as the life sciences, economics, law, and others. The proposed program aims to provide its students with a foundational breadth in computational bioengineering, which includes strong fundamentals in biology, combined with quantitative problem-solving skills. In addition, the program aims to equip its students with applicable skills in data science to position them to contribute to the fields of bioengineering, the biological sciences, and medicine beyond the capabilities of bioengineering and biomedical engineering graduates. As a result, graduates will be well-positioned for rewarding careers while also providing a workforce that will fill needs within the state of Maryland.

A key aspect of the mission of the University of Maryland College Park (UMD) for undergraduate education is that, “The University will continue to elevate the quality and accessibility of undergraduate education, with programs that are comprehensive and challenging, and that serve students well as a foundation for the workplace, advanced study, and a productive, fulfilling life.” Aligned with this, our program seeks to produce graduates with the preparative foundation in bioengineering and quantitative data science, either for employment or for pursuit of advanced degree educational programs. The University’s detailed mission statement continues, focusing on a commitment to “foster education, critical thinking and intellectual growth, ensuring the knowledge and impact of our graduates are both robust and sustainable.” This aligns closely with our aim to produce graduates with awareness of their field and an understanding of how they can utilize their unique skill sets in bioengineering and data science to address challenges facing society in both the near and long term.

Relation to Strategic Goals. The proposed major in Biocomputational Engineering (ENBC) relates to UMD’s strategic goals by adding to its STEM program offerings, most specifically at the Universities at Shady Grove (USG). UMD states the following undergraduate education objective in its Mission and Goals Statement: “Increase the number of STEM graduates by creating new programs.”

The ENBC program is one of several UMD programs planned for delivery specifically at the Universities at Shady Grove to contribute to workforce development in the state and most specifically in the Montgomery County region, taking advantage of the robust partnership with Montgomery College. USG’s mission is “to support and expand pathways to affordable, high-quality public higher education that meet the distinctive needs of the region and are designed to support workforce and economic development in the state; to achieve these goals through partnerships and collaborations with academic, business, public sector and community organizations that promote student success, high academic achievement and professional advancement.” This program contributes directly to the goals of access and affordability, to high quality programming, and to regional and state capacity building, as articulated in USG mission statement.
**Funding.** Resources for the new program will be drawn from the University System of Maryland’s Workforce Development Initiative that was approved by the State Legislature beginning in FY19. Funds were specifically directed to increasing the number of undergraduate degree offerings in STEM areas at the Universities at Shady Grove.

**Institutional Commitment.** The program will be administered by the Department of Bioengineering within the A. James Clark School of Engineering. Each of UMD’s USG programs has an on-site program director. In addition, two staff members are currently in residence at USG to support the program directors in admissions decisions and to provide academic operational support such as recruiting, outreach to community colleges, access to training, and to act as a liaison to academic services on the College Park campus. The University of Maryland (UMD) is also the managing institution for USG, and in that role supports many administrative services for the operation of USG.

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

**Need.** Bioengineering is a growing field, and one that will have a significant impact on society. A need exists for graduates trained in the fundamentals of engineering and life sciences with strong skills in computational methods and data science. A survey of the Bioengineering department’s External Advisory Board demonstrated significant enthusiasm for the program’s goals of generating graduates with knowledge of life sciences, engineering, programming, and computation. The advisory board rated the demand for these graduates at a score of 4.67 out of 5. The advisory board also emphasized that the Biopharmaceutical industry (which has a strong base in Maryland), the Biomedical Instrumentation industry, and hospitals and insurance companies are currently targeting employees with this skill set.

In recent years the Bioengineering program at UMD has placed about 30% of its graduates into graduate programs, and about 50-60% of its graduates into industry, including biopharmaceutical, biomedical instrumentation, and consulting jobs; nearly all graduates are placed before their graduation day. However, the department’s advisory board has communicated that there are additional jobs to be filled, with an emphasis on programming, computation, and data analysis that goes beyond the capabilities of the department’s graduates. While graduates in computer science are considered for these jobs, employers in the biopharma and biomedical space prefer multi-disciplinary talents, including fundamental knowledge in life sciences.

While a new program could be launched on the College Park campus, we are proposing to launch the program at USG specifically to target the talented pool of students who complete an engineering program at a community college and aim to work in the biopharma and biomedical industries. By attracting this population into the field, the proposed program will contribute strongly to the diversity of their employers, which are generally hiring from degree programs lacking in diversity.

**State Plan.** The proposed program aligns with the *Maryland State Plan for Postsecondary Education* in different ways. First, the program aligns with the state’s emphasis on career training and research. Strategy 7 of the *Maryland State Plan* is “Enhance career advising and
planning services and integrate them explicitly into academic advising and planning.” Career advising will not only be integrated with student advising, it will also be incorporated in the program coursework. All of the core courses for the program will help students achieve this outcome.

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

Analysis of job outlook data from Emsi ([https://www.economicmodeling.com/data/](https://www.economicmodeling.com/data/)) has projected job trends in the field of bioinformatics in the MD/VA/DC region. Note that in the proposed program we use the term “bioinformatics” specifically to imply the analysis of genomic and proteomic data; however, the term is frequently used to describe more generally information science, data analysis, and computation as applied to the life sciences. The analysis suggests that in Maryland, bioinformatics jobs will increase from about 60,000 to about 70,000 between 2018 and 2028, a 16% change (it predicts a 7% regional change and a 16% national change over the same period). Note that this analysis does not include the expected Amazon headquarters in Northern Virginia.

The Emsi report cites Booz Allen Hamilton, Leidos Holdings, and Oracle as likely employers. In addition to Amazon, the department’s External Advisory Board has identified the following as employers for the graduates of the proposed program: Becton Dickinson (BD), Roche, Abbott, Beckman, Siemens, GE, Amgen, Kite Pharma, Edwards Life Sciences, numerous hospitals and insurance companies, and most biopharmaceutical companies. In addition, federal and federally-supported laboratories, including NIH, FDA, NRL, NIST, and APL are in need of employees with computational skills and fundamentals in life science and engineering.

**D. Reasonableness of Program Duplication**

Most closely related to the proposed Biocomputational Engineering program is the Bioengineering program that already exists at College Park (and exists within the same Bioengineering Department as the proposed program). The first half of the program is almost the same, but the second half of the programs differ significantly. The proposed program offers opportunities for training in programming, computational methods, and data science that go well beyond that of a “track” or “specialization.” Thus, the graduates from the proposed program would be unique in the Clark School.

Bowie State University offers a Bioinformatics degree that has similarities to the proposed program, including the opportunity for training in both the life sciences and computer programming. At the same time, UMGC offers a degree in Biotechnology, while UMBC offers a degree in Translational Life Science Technology at Shady Grove. Some overlap will exist in the skill sets between these graduates and graduates from the proposed program. However, the key

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difference is that the proposed program is an engineering degree, and thus will emphasize an engineering approach to problem solving above all else.

E. Relevance to Historically Black Institutions (HBIs)

Currently no HBIs offer similar undergraduate programs with the exception of Bowie State University’s Bioinformatics program mentioned above. In addition to the aforementioned differences, USG has a regional draw that is rather specific to Central Maryland because of the lack of on-site housing for students. Thus, there is not likely to be much overlap in the student populations. Morgan State University offers a Master’s program in Bioinformatics, and as a result the program proposed here might serve as a feeder.

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

The proposed program would not have an impact on the uniqueness or institutional identity of any Maryland HBI, since this program would be a unique offering in the state.

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

Curricular Development. The curriculum was developed by faculty of Bioengineering department. All of the undergraduate programs within the A. James Clark School of Engineering are “limited enrollment programs”, due to high demand and finite capacity.

The program will be offered exclusively at the Universities at Shady Grove. All undergraduate programs at USG are years 3 and 4 only. Expectations for lower-level coursework will be established through articulation agreements with the Maryland community colleges or taken at College Park prior to admission to the School of Engineering and the major. The proposed curriculum will offer courses at the 300- and 400-level, which constitute the junior and senior year of the program. The program is primarily intended for students transferring from a Maryland public community college. While students at the College Park campus can pursue the program, they will not be able to seek admission into the School of Engineering and the Biocomputational Engineering major until they have completed the Engineering Limited Enrollment Program (LEP) gateway courses, required prior study major courses, lower-level General Education requirements (or an Associate’s Degree), and have earned at least 60 credits. Due to the similarity in curriculum content and the physical location of course offerings, students in the Bioengineering program at UMD will not be eligible to add Biocomputational Engineering as a second major or degree (and vice versa).

Faculty Oversight. The faculty within the department of Bioengineering will provide academic direction and oversight for the program. Appendix A contains a list of the BIOE tenured and tenure-track faculty.

Educational Objectives and Learning Outcomes. The educational objectives of the program including the following:
1. Produce graduates with the educational depth, technical skills, and practical experiences to be competitive for placement in Biocomputational Engineering careers or post-graduate educational pursuits;

2. Produce graduates with an awareness of their field and an understanding of how they can address the data-driven computational biomedical challenges facing society in both the near and long term;

3. Produce graduates with a foundation in professional ethics who will actively seek to positively impact their profession, community, and society.

The student learning outcomes are aligned with the outcomes assessed in accordance with the Accreditation Board for Engineering and Technology (ABET) accreditation requirements and include the following. The program must enable students to attain, by the time of graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Institutional assessment and documentation of learning outcomes. Each learning outcome is mapped to one or more courses in the program for assessment. Each course will be assessed once every three years (i.e., twice per ABET cycle) to determine whether the program is achieving each outcome; at least one course will be assessed every year. The assessment will be conducted by the instructor; the instructor will then submit the assessment to the Bioengineering department’s Undergraduate Studies Committee. This committee will provide recommendations for modifications to the instructor. The assessment reports follow a template developed by the department.

In addition to the course assessment process, a senior exit survey will be conducted prior to graduation every year. Students will be asked to assess their capabilities related to the seven learning outcomes above. These results will be reviewed by the Undergraduate Studies Committee and recommendations for improvements to the curriculum will be provided to the program’s Director as needed.
Course requirements.

**FIRST & SECOND YEAR**

Prior to being admitted to the Biocomputational Engineering major, students should have completed the Engineering LEP gateway courses, basic math/science courses, and lower-level General Education requirements. Below is the representative set of requirements; specific articulation agreements will be established with each of the local community colleges.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Academic Writing</td>
<td>3</td>
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<tr>
<td>MATH 140</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 246</td>
<td>Differential Equations for Scientists and Engineers</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 135/136</td>
<td>General Chemistry for Engineers (plus lab)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 231/232</td>
<td>Organic Chemistry (plus Laboratory)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 161</td>
<td>General Physics: Mechanics and Particle Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 260/261</td>
<td>General Physics: Vibration, Waves, Heat, Electricity and Magnetism (plus Laboratory)</td>
<td>4</td>
</tr>
<tr>
<td>ENES 100</td>
<td>Introduction to Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>BSCI 170 OR BIOE 120</td>
<td>Principles of Molecular &amp; Cellular Biology OR Biology for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 241</td>
<td>Matlab Programming Course (or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>GenEd Courses</td>
<td>General Education Requirements</td>
<td>18</td>
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<tr>
<td><strong>Total Credits</strong></td>
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<td><strong>60</strong></td>
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</table>

**JUNIOR & SENIOR YEARS AT SHADY GROVE**

**Junior Year 1st Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr</th>
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<tbody>
<tr>
<td>ENBC 301</td>
<td>Introduction to Biocomputational Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ENBC 311</td>
<td>Python for Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 331</td>
<td>Applied Linear Systems and Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 332</td>
<td>Statistics, Data Analysis, and Data Visualization</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 341</td>
<td>Biomolecular Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 351</td>
<td>Quantitative Molecular and Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Semester Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
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</table>
### Junior Year 2nd Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr</th>
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</thead>
<tbody>
<tr>
<td>ENBC 312</td>
<td>Object Oriented Programming in C++</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 322</td>
<td>Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 342</td>
<td>Computational Fluid Dynamics and Mass Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 352</td>
<td>Molecular Techniques Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Semester Credits</strong></td>
<td></td>
<td><strong>14</strong></td>
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</table>

### Senior Year 1st Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr</th>
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<tbody>
<tr>
<td>ENBC 321</td>
<td>Machine Learning for Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 353</td>
<td>Synthetic Biology</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 431</td>
<td>Finite Element Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 393</td>
<td>Professional Writing</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Semester Credits</strong></td>
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</table>

### Senior Year 2nd Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENBC 425</td>
<td>Imaging and Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 441</td>
<td>Computational Systems Biology</td>
<td>3</td>
</tr>
<tr>
<td>ENBC 491</td>
<td>Senior Capstone Design in Biocomputational Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Two Electives</td>
<td></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>Total Semester Credits</strong></td>
<td></td>
<td><strong>15</strong></td>
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</tbody>
</table>

**TOTAL DEGREE CREDITS** 120

Students are required to take four technical electives. The courses must be selected from an approved list of engineering and biology courses; the list will be updated regularly by the Program Director. At least two of the elective courses must be from the category of engineering, mathematics, or programming, while at most two of the electives can be from the category of biology courses. The program will offer electives; at the same time, the program will arrange for opportunities for electives outside the program, including USG programs offered by other universities.

See Appendix B for course descriptions.

**General Education.** Students will complete their science and mathematics general education requirements by way of fulfilling major requirements. Students who transfer to UMD with an Associate’s degree from a Maryland community college are deemed to have completed their General Education requirements with the exception of Professional Writing, which is typically taken in their third year of study.
Accreditation or Certification Requirements. As with other undergraduate Engineering degree programs at UMD, the Clark School of Engineering will seek to have this program accredited by the Accreditation Board of Engineering and Technology (ABET).

Other Institutions or Organizations. The department will not contract with another institution or non-collegiate organization for this program.

Student Support. To fully serve the academic and support needs of the Biocomputational Engineering students, the program will employ one full-time academic advisor at Shady Grove. Anticipating student growth, additional part-time or full-time advisors will be needed in subsequent years. All academic advisors will report directly to the Fischell Department of Bioengineering Associate Director of Academic and Student Affairs. Academic advisors at Shady Grove will manage course scheduling, perform academic advising each semester, track degree requirements, and provide academic and support resources when appropriate. The academic advising team will also assist in outreach efforts and building a strong community among prospective and current students. Additionally, the Biocomputational Engineering major will identify a Faculty Program Director who will reside at Shady Grove at least two days per week. The Faculty Program Director will work closely with the UMD liaisons as well as all tenure-track (TTK) and professional-track (PTK) faculty in addressing student and instructor concerns, developing electives, and performing assessment measures. Additional services are provided for all programs at the Universities at Shady Grove through USG's Center for Academic Success.

Marketing and Admissions Information. The department will produce marketing materials and will conduct recruitment events at various times in the year. Admissions will be administered by UMD's Undergraduate Admissions Shady Grove Coordinator and the Biocomputational Engineering Program Director. Following procedures previously established at the Universities at Shady Grove, the Clark School’s Assistant Director of Transfer Student Advising and Admissions will review the accepted Biocomputational Engineering cohort to ensure all students meet the Clark School’s LEP admission criteria. It is expected that admissions will require only a minimal burden upon the Clark School staff and the Fischell Department of Bioengineering staff.

H. Adequacy of Articulation

Montgomery College is expected to be the largest feeder, although students who have completed two years in any engineering program in a Maryland Community College will be eligible for admission provided they meet the program’s eligibility requirements. The Clark School’s requirements for transfer students are articulated with the Montgomery College Associate of Science in Engineering. Montgomery College students can enter the program upon completing the Bioengineering focus at Montgomery College with a few substitutions that will be communicated between the Bioengineering Department and Montgomery College. The pathway to articulation into the current Bioengineering degree is articulated through Montgomery College’s Associate of Science in Engineering, Bioengineering. In addition to the community college population, current students within the Clark School of Engineering are eligible to change majors into the Biocomputational Engineering Program; in particular, students from the Bioengineering major will meet the requirements upon completion of the sophomore year.
I. Adequacy of Faculty Resources

*Program faculty.* Appendix A contains a full list of Bioengineering department faculty. It is expected that two TTK faculty and four PTK lecturers will represent the program at USG. This is sufficient to provide 8 courses per semester, which enables coverage of all of the planned ENBC courses (the program requires sixteen ENBC courses, but three of those are 1 credit only). Adjunct faculty may also be contracted to cover courses as needed. Class sizes are expected to be on the order of 30 students, and thus teaching assistants will not be needed. Undergraduate Teaching Fellows (senior students in the program) will be used to support courses when possible.

*Faculty training.* All faculty will receive guidance from the Bioengineering Department, which considers teaching to be critical to the success of its program. For the learning management system, faculty teaching in this program 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. For online elements of the coursework, 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. Resources are available locally at USG’s Priddy Library as well as on the College Park campus.

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

The program will be delivered in the new Biomedical Sciences and Engineering Education (BSE) building (also called Building IV) at the Universities at Shady Grove. This state-of-the-art educational facility has a suite of shared active-learning classrooms, computing resources, wet labs, a dental clinic, product design laboratory and maker space, as well as offices for faculty and staff delivering the curricula and student support services. The ENBC program expects to have 1-2 dedicated laboratory spaces for its programmatic needs.

L. Adequacy of Financial Resources

Resources for the program will come from tuition revenue and from the Governor’s Workforce Development Initiative funds that were specifically directed towards implementation of STEM degree programs at the Universities at Shady Grove. Students in this program will represent new enrollment at UMD; the tuition revenue associated with this enrollment will be directed towards program needs. Tuition revenue alone is not adequate to support the program; UMD, USG and USM have articulated a memorandum of understanding to maintain funding for the program, beyond revenue expected from tuition. 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 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

An important aspect of this program is to draw upon students in the community colleges, which have traditionally large numbers of African and Latino Americans, and thereby improving the numbers of underrepresented minorities in STEM education. This will be a factor in student recruitment.

O. Relationship to Low Productivity Programs Identified by the Commission

N/A

P. Adequacy of Distance Education Programs

N/A
Tables 1 and 2: Resources and Expenditures

### TABLE 1: RESOURCES

<table>
<thead>
<tr>
<th>Resources Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reallocated Funds</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>2. Tuition/Fee Revenue (c+g below)</td>
<td>$233,600</td>
<td>$481,216</td>
<td>$867,392</td>
<td>$1,021,044</td>
<td>$1,051,675</td>
</tr>
<tr>
<td>a. #FT Students</td>
<td>20</td>
<td>40</td>
<td>70</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>b. Annual Tuition/Fee Rate</td>
<td>$11,680</td>
<td>$12,030</td>
<td>$12,391</td>
<td>$12,763</td>
<td>$13,146</td>
</tr>
<tr>
<td>c. Annual FT Revenue (a x b)</td>
<td>$233,600</td>
<td>$481,216</td>
<td>$867,392</td>
<td>$1,021,044</td>
<td>$1,051,675</td>
</tr>
<tr>
<td>d. # PT Students</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>e. Credit Hour Rate</td>
<td>$485.00</td>
<td>$499.55</td>
<td>$514.54</td>
<td>$529.97</td>
<td>$545.87</td>
</tr>
<tr>
<td>f. Annual Credit Hours</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>g. Total Part Time Revenue (d x e x f)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>3. Grants, Contracts, &amp; Other External Sources</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>4. Other Sources</td>
<td>$900,000</td>
<td>$900,000</td>
<td>$900,000</td>
<td>$900,000</td>
<td>$900,000</td>
</tr>
<tr>
<td><strong>TOTAL (Add 1 - 4)</strong></td>
<td><strong>$1,133,600</strong></td>
<td><strong>$1,381,216</strong></td>
<td><strong>$1,767,392</strong></td>
<td><strong>$1,921,044</strong></td>
<td><strong>$1,951,675</strong></td>
</tr>
</tbody>
</table>

Tuition revenue is based on AY2019–20 rates for the A. James Clark School of Engineering. It does not include mandatory fees or laboratory fees. Reallocated funds assume support from the States Workforce Development Initiative targeted towards programs to be delivered at the Universities at Shady Grove.
### TABLE 2: EXPENDITURES

<table>
<thead>
<tr>
<th>Expenditure Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Full time Faculty (b+c below)</td>
<td>$399,000</td>
<td>$547,960</td>
<td>$705,499</td>
<td>$871,996</td>
<td>$898,156</td>
</tr>
<tr>
<td>a. #FTE</td>
<td>3.0</td>
<td>4.0</td>
<td>5.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>b. Total Salary</td>
<td>$300,000</td>
<td>$412,000</td>
<td>$530,450</td>
<td>$655,636</td>
<td>$675,305</td>
</tr>
<tr>
<td>c. Total Benefits</td>
<td>$99,000</td>
<td>$135,960</td>
<td>$175,049</td>
<td>$216,360</td>
<td>$222,851</td>
</tr>
<tr>
<td>2. Part time Faculty (b+c below)</td>
<td>$12,000</td>
<td>$24,000</td>
<td>$60,000</td>
<td>$60,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>a. #FTE</td>
<td>0.2</td>
<td>0.4</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>b. Total Salary</td>
<td>$12,000</td>
<td>$24,000</td>
<td>$60,000</td>
<td>$60,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>c. Total Benefits</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>3. Admin. Staff (b+c below)</td>
<td>$186,200</td>
<td>$191,786</td>
<td>$246,924</td>
<td>$254,332</td>
<td>$261,962</td>
</tr>
<tr>
<td>a. #FTE</td>
<td>2.0</td>
<td>2.0</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>b. Total Salary</td>
<td>$140,000</td>
<td>$144,200</td>
<td>$185,658</td>
<td>$191,227</td>
<td>$196,964</td>
</tr>
<tr>
<td>c. Total Benefits</td>
<td>$46,200</td>
<td>$47,586</td>
<td>$61,267</td>
<td>$63,105</td>
<td>$64,998</td>
</tr>
<tr>
<td>4. Technical Support staff (b+c below)</td>
<td>$53,200</td>
<td>$54,796</td>
<td>$56,440</td>
<td>$58,133</td>
<td>$59,877</td>
</tr>
<tr>
<td>a. #FTE</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>b. Total Salary</td>
<td>$40,000</td>
<td>$41,200</td>
<td>$42,436</td>
<td>$43,709</td>
<td>$45,020</td>
</tr>
<tr>
<td>c. Total Benefits</td>
<td>$13,200</td>
<td>$13,596</td>
<td>$14,004</td>
<td>$14,424</td>
<td>$14,857</td>
</tr>
<tr>
<td>5. Graduate Assistants (b+c below)</td>
<td>$26,600</td>
<td>$53,200</td>
<td>$53,200</td>
<td>$53,200</td>
<td>$53,200</td>
</tr>
<tr>
<td>a. #FTE</td>
<td>1.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>b. Stipend</td>
<td>$20,000</td>
<td>$40,000</td>
<td>$40,000</td>
<td>$40,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>c. Tuition Remission + benefits</td>
<td>$6,600</td>
<td>$13,200</td>
<td>$13,200</td>
<td>$13,200</td>
<td>$13,200</td>
</tr>
<tr>
<td>6. Equipment</td>
<td>$50,000</td>
<td>$25,000</td>
<td>$25,000</td>
<td>$25,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>7. Library</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>8. New or Renovated Space</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>9. Marketing/Advertising</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>10. Other Expenses: Operational Expenses</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>11. Office Space Rental</td>
<td>$10,500</td>
<td>$10,815</td>
<td>$11,139</td>
<td>$11,474</td>
<td>$11,818</td>
</tr>
<tr>
<td>12. Classroom Rental</td>
<td>$0</td>
<td>$9,000</td>
<td>$9,270</td>
<td>$9,548</td>
<td>$9,835</td>
</tr>
<tr>
<td>13. university administrative fee</td>
<td>$23,360</td>
<td>$48,122</td>
<td>$86,739</td>
<td>$102,104</td>
<td>$105,168</td>
</tr>
<tr>
<td><strong>TOTAL (Add 1 - 13)</strong></td>
<td><strong>$820,860</strong></td>
<td><strong>$1,024,679</strong></td>
<td><strong>$1,314,211</strong></td>
<td><strong>$1,505,788</strong></td>
<td><strong>$1,545,015</strong></td>
</tr>
</tbody>
</table>

Notes: Graduate assistants are included in the budget to support instruction; however, if the class sizes are as anticipated, it is more likely that the department will use undergraduate teaching assistants which will change the budget slightly. Other expenses include tuition remission for graduate assistants, lab equipment and software maintenance, materials and supplies, program outreach, and travel related to the program.
Appendix A: Faculty in the Fischell Department of Bioengineering

All faculty hold doctoral degrees in a field relevant to the discipline. Faculty biographies and research interests can be found in the department’s web site (https://bioe.umd.edu/clark/facultydir?drfilter=1). 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 at Shady Grove.

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Highest Degree Earned - Field and Year</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aranda-Espinoza, Helim</td>
<td>Physics, 1998</td>
<td>Associate Professor and Associate Chair</td>
</tr>
<tr>
<td>Benton, William Clyne, Alisa</td>
<td>Chemical Engineering, 1989 Medical and Mechanical Engineering, 2006</td>
<td>Fischell Distinguished Professor Associate Professor</td>
</tr>
<tr>
<td>Duncan, Gregg</td>
<td>Chemical and Biomolecular Engineering, 2014</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Eisenstein, Edward</td>
<td>Biochemistry, 1985</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Fisher, John</td>
<td>Bioengineering, 2003</td>
<td>Fischell Distinguished Prof and Chair</td>
</tr>
<tr>
<td>He, Xiaoming</td>
<td>Mechanical Engineering, 2004</td>
<td>Professor</td>
</tr>
<tr>
<td>Huang, Huang-Chiao</td>
<td>Chemical Engineering, 2012</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Jay, Steven</td>
<td>Biomedical Engineering, 2009</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Jewell, Christopher</td>
<td>Chemical Engineering, 2008</td>
<td>Minta Martin Professor of Engineering and Associate Professor/Chair</td>
</tr>
<tr>
<td>Jones, Angela</td>
<td>Chemical Engineering, 2010</td>
<td>Senior Lecturer</td>
</tr>
<tr>
<td>Ma, Lan</td>
<td>Electrical &amp; Computer Engineering, 2004</td>
<td>Lecturer</td>
</tr>
<tr>
<td>Maisel, Katharina</td>
<td>Biomedical Engineering, 2014</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Matysiak, Silvina</td>
<td>Chemistry, 2007</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Montas, Hubert</td>
<td>Agricultural and Biological Engineering, 1996</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Pranda, Marina</td>
<td>Bioengineering, 2019</td>
<td>Lecturer</td>
</tr>
<tr>
<td>Scarcelli, Giuliano</td>
<td>Applied Physics, 2006</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Stroka, Kimberly</td>
<td>Bioengineering, 2011</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Tao, Yang</td>
<td>Biological Engineering, 1991</td>
<td>Professor</td>
</tr>
<tr>
<td>White, Ian</td>
<td>Electrical Engineering, 2002</td>
<td>Associate Professor and Associate Chair</td>
</tr>
<tr>
<td>Zhang, Li-Qun</td>
<td>Biomedical Engineering, 1990</td>
<td>Professor</td>
</tr>
</tbody>
</table>
Appendix B: Course Descriptions

Some courses will be new to this program; they will be approved through the university’s standard course approval process prior to delivery.

**ENBC301: Introduction to Biocomputational Engineering**
**Credits:** 1
**Grading method:** regular
**Prerequisites:** none
**Restriction:** Permission of ENGR-Fischell Department of Bioengineering department; and must be in Biocomputational Engineering major.
**Description:** Provides practical tools to help Biocomputational Engineering majors to think critically about their goals and career paths and to utilize their major to set their career trajectory.

**ENBC311: Python for Data Analysis**
**Credits:** 3
**Grading method:** regular
**Prerequisites:** none
**Restriction:** Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
**Credit only granted for:** BIOE489A or BIOE442 or ENBC311.
**Description:** Provides an introduction to structured programming, computational methods, and data analysis techniques with the goal of building a foundation allowing students to confidently address problems in research and industry. Fundamentals of programming, algorithms, and simulation are covered from a general computer science perspective, while the applied data analysis and visualization portion makes use of the Python SciPy stack.

**ENBC312: Object Oriented Programming in C++**
**Credits:** 3
**Grading method:** regular
**Prerequisites:** none
**Restriction:** Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
**Description:** Provides an introduction to object-oriented programming in the C++ language.

**ENBC321: Machine Learning for Data Analysis**
**Credits:** 3
**Grading method:** regular
**Prerequisites:** completion of ENBC312 and ENBC332 with a grade of “C-” or better.
**Restriction:** Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
**Description:** Provides an introduction to artificial intelligence methods for mining big data sets and for making decisions using data sets.
ENBC322: Algorithms
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC311 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: ENEB355 or ENBC322.
Description: Utilizing the Python programming language for a systematic study of the complexity of algorithms related to sorting, graphs and trees, and combinatorics. Algorithms are analyzed using mathematical techniques to solve recurrences and summations.

ENBC331: Applied Linear Systems and Differential Equations
Credits: 3
Grading method: regular
Prerequisites: completion of MATH246 and Matlab prior study requirement with a grade of “C-” or better. Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE371 or ENBC331.
Description: Applications of linear algebra and differential equations to bioengineering and biomolecular systems. Designed to instruct students to relate mathematical approaches in bioengineering to their physical systems. Examples will emphasize fluid mechanics, mass transfer, and physiological systems.

ENBC332: Statistics, Data Analysis, and Data Visualization
Credits: 3
Grading method: regular
Prerequisites: none
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE372 or ENBC332 or STAT464.
Description: This course will instruct students in the fundamentals of probability and statistics through examples in biological phenomenon and clinical data analysis. Data visualization strategies will also be covered.

ENBC341: Biomolecular Engineering Thermodynamics
Credits: 3
Grading method: regular
Prerequisites: completion of MATH246 and PHYS260 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE232 or ENBC341 or CHBE301.
Description: A quantitative introduction to thermodynamic analysis of biomolecular systems. The basic laws of thermodynamics will be introduced and explained through a series of examples related to biomolecular systems.
ENBC342: Computational Fluid Dynamics and Mass Transfer
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC341 and Matlab prior study requirement with a grade of “C-” or better; and must have completed (with a grade of “C-” or better) or be concurrently enrolled in ENBC331.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE331 or ENBC342.
Description: Principles and applications of fluid mechanics and mass transfer with a focus on topics in the life sciences and an emphasis on computational methods and modeling. Content includes conservation of mass, momentum, and energy, as well as the application of these fundamental relations to hydrostatics, control volume analysis, internal and external flow, and boundary layers. Applications to biological and bioengineering problems such as tissue engineering, bioprocessing, imaging, and drug delivery.

ENBC351: Quantitative Molecular and Cellular Biology
Credits: 3
Grading method: regular
Prerequisites: Completion of BSCI170 prior study with a grade of “C-” or better. Co-requisites: none
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Quantitative analysis of the behavior of cellular and molecular systems.

ENBC352: Molecular Techniques Laboratory
Credits: 2
Grading method: regular
Prerequisites: Must have completed (with a grade of “C-” or better) or be concurrently enrolled in ENBC351. Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Wet lab experiments to observe cellular and molecular processes and phenomenon.

ENBC353: Synthetic Biology
Credits: 3
Grading method: regular
Prerequisites: Completion of BSCI170 prior study with a grade of C- or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE461 or ENBC353.
Description: Students are introduced to the scientific foundation and concepts of synthetic biology and biological engineering. Current examples that apply synthetic biology to fundamental and practical challenges will be emphasized. The course will also address the societal issues of synthetic biology, and briefly examine interests to regulate research in this area.
ENBC411: Advanced Programming in Python
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC311 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Advanced programming methods with an emphasis on biocomputational applications.

ENBC413: Data Analysis with R
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC332 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Provides an introduction to programming techniques for data analysis with the statistical software “R.”

ENBC425: Imaging and Image Processing
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC321 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Examines the physical principles behind major biomedical imaging modalities, including X-Ray, CT, MRI. Instructs students in mathematical tools for extracting information from images. Provides an introduction to the use of machine learning for interpreting images. Matlab and/or Python utilized for image processing exercises.

ENBC431: Finite Element Analysis
Credits: 3
Grading method: regular
Prerequisites: completion of MATH246 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Instructs students to use computer tools to analyze the thermal and mechanical properties of devices or systems. The course will focus specifically on the biomechanics of biomedical devices.

ENBC435: Numerical Methods
Credits: 3
Grading method: regular
Prerequisites: none
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: The review of numerous mathematical methods to simplify complex problems.
ENBC441: Computational Systems Biology
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC351 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Introduction to building computer models that analyze dynamic functions within a cell, organ, tissue, or organism.

ENBC442: Computational Molecular Dynamics
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC341 and ENBC332 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE464 or ENBC442.
Description: Designed to introduce students to the principles, methods, and software used for simulation and modeling of macromolecules of biological interest such as proteins, lipids, and polysaccharides. Class topics: Basic statistical thermodynamics, force fields, molecular dynamics/ monte carlo methods, conformational analysis, fluctuations & transport properties, free-energy calculations, multiscale modeling.

ENBC443: Multiscale Simulation Methods
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC341 and ENBC332 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Credit only granted for: BIOE463 or ENBC443.
Description: Introduction to approaches to modeling a system at different scales, such as atomic, molecular, and macromolecular. Examples will focus on proteins for which models include the interactions with water, atomic interactions within the molecule, and interactions between multiple molecules; models that span both short and long-time scales are also studied.

ENBC444: Modeling Protein Folding
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC341 and ENBC332 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Computational prediction of the structure of proteins with applications in protein misfolding diseases such as Alzheimer’s Disease and other prion diseases.
ENBC445: Spatial Control of Biological Agents
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC342 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Description and solution of the movement of passive and active biological agents in homogeneous and heterogeneous bioenvironments using partial differential equations and numerical methods. Identification and diagnosis of hot spots. Prescription of control strategies using techniques from Artificial Intelligence (AI) and verification of effectiveness. Applications environments may include landscapes and tissues.

ENBC455: Bioinformatics Engineering
Credits: 3
Grading method: regular
Prerequisites: completion of ENBC311 with a grade of “C-” or better.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Introduces students to core problems in bioinformatics, along with databases and tools that have been developed to study them. Students will learn to utilize Python to process data sets.

ENBC491: Senior Capstone Design in Biocomputational Engineering
Credits: 3
Grading method: regular
Prerequisites: completion of 18 credits in ENBC courses.
Restriction: Permission of ENGR-Fischell Department of Bioengineering department; and must be in the Biocomputational Engineering major.
Description: Senior design project, in which students work in teams to utilize the skills acquired through the major to identify and solve quantitative problems in bioengineering. Ethics in bioengineering and biotechnology will also be covered.

ENGL393: Technical Writing
Credits: 3
Grading method: regular Prerequisites: ENGL101.
Restriction: Must have earned a minimum of 60 credits. Description: The writing of technical papers and reports.
**TOPIC:** University of Maryland, College Park: Master of Arts in International Relations

**COMMITTEE:** Education Policy and Student Life

**DATE OF COMMITTEE MEETING:** Friday, March 6, 2020

**SUMMARY:** The University of Maryland, College Park proposes to establish a Master of Arts in International Relations. The curriculum includes coursework in international political economy, international security, international law, and statistical methods of data analysis for international relations research. The program is designed for students with career goals in international relations research and analysis, whether in a conventional academic career as a university faculty member, or a professional career requiring sophisticated applied research and analysis of international relations issues, such as within agencies of the federal government.

The curriculum consists of 10 three-credit courses (30 credits total) divided into two phases: (1) three foundational graduate courses (9 credits) taken at the beginning of the program, and (2) seven core graduate courses (21 credits) taken to complete the program. During the final semester, students will complete a capstone research project.

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

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

**CHANCELLOR’S RECOMMENDATION:** That the Committee on Education Policy and Student Life recommend that the Board of Regents approve the proposal from the University of Maryland, College Park to offer the Master of Arts in International Relations.

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**COMMITTEE RECOMMENDATION:**

**DATE:**

**BOARD ACTION:**

**DATE:**

**SUBMITTED BY:** Joann A. Boughman 301-445-1992 jboughman@usmd.edu
January 27, 2020

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 Arts program in International Relations. 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, and was recommended for approval by the University Senate at its meeting on December 4, 2019. I also endorse this proposal and am pleased to submit it for your approval.

Sincerely,

Wallace D. Loh
President

MDC
cc: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs
    Mary Ann Rankin, Senior Vice President and Provost
    Gregory Ball, Dean, College of Behavioral and Social Sciences
UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

- New Instructional Program
- Substantial Expansion/Major Modification
- Cooperative Degree Program
- Within Existing Resources, or
- Requiring New Resources

University of Maryland, College Park
Institution Submitting Proposal

International Relations
Title of Proposed Program

<table>
<thead>
<tr>
<th>Master of Arts</th>
<th>Fall 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award to be Offered</td>
<td>Projected Implementation Date</td>
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<table>
<thead>
<tr>
<th>221000</th>
<th>45.0901</th>
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<tbody>
<tr>
<td>Proposed HEGIS Code</td>
<td>Proposed CIP Code</td>
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Government and Politics
Department in which program will be located

<table>
<thead>
<tr>
<th>301-314-8481</th>
<th><a href="mailto:phuth@umd.edu">phuth@umd.edu</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Phone Number</td>
<td>Contact E-Mail Address</td>
</tr>
</tbody>
</table>

Signature of President or Designee

January 27, 2020
Date
A. Centrality to the University’s Mission and Planning Priorities

Description. The University of Maryland, College Park (UMD) proposes to establish a Master of Arts in International Relations. The curriculum includes coursework in international political economy, international security, international law, and statistical methods of data analysis for international relations research. The program is designed to provide advanced coursework and applied quantitative methods training for students seeking careers as researchers in academia or research analysts in the public and private sectors. The program focuses on developing basic and applied research skills through coursework that emphasizes quantitative methods and datasets, as well as rigorous academic theory and empirical research. The impetus and design of the program align with the UMD’s mission to use “its research educational, cultural, and technological strengths in partnership with state, federal, private, and non-profit sectors to promote economic development and improve quality of life in the state of Maryland.”1 UMD Government and Politics researchers working with policy makers from USAID, the Department of Defense, and the State Department over the past 10 years have found repeated evidence that (a) government officials and analysts often lack strong quantitative research skills and the ability to understand quantitative research, and (b) these officials recognize that there is a need for stronger evidence-based quantitative analyses to inform policy choices. The proposed program will enhance the capabilities of international relations professionals and provide a strong empirical foundation for those who go on to doctoral studies in international relations. This program is designed primarily to be a part of a combined bachelor’s/master’s program. UMD currently offers a Bachelor of Arts degree in Government and Politics that has an International Relations area of concentration and this combined bachelor’s/master’s program would be available only to undergraduate majors within Government and Politics. UMD is also exploring an admissions partnership with Jilin University in China.

Relation to Strategic Goals. Among UMD’s strategic goals for graduate education is to provide advanced education for the professional workforce and to prepare graduate students to be leaders in their fields. As stated in UMD’s Strategic Plan, “The University will maintain excellent professional graduate programs that are nationally recognized for their contributions to the practice of the professions, for their forward-looking curricula, and for their spirit of innovation and creativity... Our Master’s and professional doctoral graduates will provide leadership in their fields and will be known for their command of the theories and practices of their chosen disciplines.”2 Students in the program will not only understand the central theoretical approaches to studying international relations, but they will also be trained in quantitative research methods, research design, statistical modeling, and data analysis. As a result, the program will be distinguished from other international relations programs that do not have the same emphasize on quantitative methods training and analysis.

Funding. Resources for the new program will be drawn from tuition revenue and from reallocated funds through the Office of the Provost.

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Institutional Commitment. The program will be offered by the Department of Government and Politics. UMD’s Office of Extended Studies, which provides streamlined administrative support for professional graduate programs across the campus, will provide administrative support for the program. In the event that the program is discontinued, the courses will be offered for a reasonable time period so that enrolled students can finish the program. The faculty and administrative infrastructure will still be in place to work with students who have not finished the program.

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

Need. The program is intended to support students with career goals centered in research and analysis, whether in a conventional academic career as a university faculty member, or a professional career that requires sophisticated applied research in the analysis of international relations issues. For students with professional goals to specialize as research analysts in government agencies, private firms, non-governmental organizations, and international institutions, the program would provide the advanced coursework and training to engage in quantitative analyses of policy-relevant international relations issues and to ground that analysis in relevant international relations literatures from academic research. UMD faculty has learned from interactions with international relations professionals in federal agencies that professionals need to have strong quantitative research and analysis skills to better inform policy decisions. To meet this need, the program will require quantitative methods and analyses courses and infuse its course readings with substantial quantitative and research design material.

State Plan. As noted in strategy 8 of the Maryland State Plan for Postsecondary Education, “More than ever, employers seek employees who have the flexibility to understand changing conditions and solve emerging problems.” This program reflects the call for innovation in the Maryland State plan by responding to the need from the international relations community for additional training in quantitative methods. Such training will allow graduates to better understand the quantitative dimension of pressing international problems.

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

Graduates of this program will likely go on to become research analysts in government, journalism, law, non-governmental organizations, and international business. Some students may choose to pursue further study in a doctoral program, although this program is not intended to be a feeder to UMD’s doctoral program in Government and Politics. As noted above, UMD faculty have discovered a particular demand among federal agencies for international relations professionals with strong quantitative skills. Neither the US Bureau of Labor Statistics nor the Maryland Department of Labor record occupational projections specifically for international relations professionals, but research conducted by the UMD’s Government and Politics

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department demonstrates significant interest. In a survey conducted in August 2019, the department sought information on undergraduate students' overall interest in pursuing graduate studies in International Relations. The survey population included close to 1,000 undergraduate student majors in the Government and Politics Department. More than 70% of surveyed students indicated that they were somewhat or highly interested in the program. Among Government and Politics majors who had or planned to complete a concentration in International Relations, the level of interest was more than 75%. The department plans to launch a combined bachelor’s/master’s program for international relations once the master’s program is approved. The undergraduate major’s international relations concentration has proven to be very popular. Nearly 400 students have declared the international relations concentration since it was established three years ago. The success of the international relations concentration indicates a pool of students that might benefit from an international relations master’s program. Partners at Jilin University indicated that each year approximately 20-30% of 1100 students graduating from Jilin University in four targeted schools pursue graduate education in the US. Based on conversations with senior leadership at Jilin University, the department estimates 20-25 students from Jilin University in the first International Relations cohort should the partnership be established.

D. Reasonableness of Program Duplication

According to MHEC’s online program inventory website, there are two programs with comparable titles: Johns Hopkins University’s Master of Arts in International Studies and Morgan State University’s Master of Arts in International Studies. UMD’s program is strictly government and politics oriented, heavily focused on quantitative research and analysis, and is designed as a counterpart master’s program for a combined bachelor’s/master’s program. As indicated above, a sufficient student population exists within UMD’s own undergraduate program and students from Jilin University to warrant the program’s establishment. UMD’s professionally accredited, 48-credit Master of Public Policy program has coursework and some focus in International Relations, but the overall content of the program is broader than that proposed here and is designed to recruit a broader audience of students. The two units have been in conversation to clarify the distinctions between the programs in their communication to students and recruiting materials.

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

As indicated above, UMD’s goal is not to recruit students that would be interested in a “stand-alone” master’s program. UMD will therefore not impact Morgan State University’s recruitment as the target population for the UMD program are only students in specific undergraduate Government and Politics programs and through international collaborations with Jilin University.

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

International Relations itself is not a unique area for any specific institution among the state’s HBI’s. Johns Hopkins also operates an International Studies program. Only Goucher College has a program that has the title International Relations (an undergraduate program). No other current master’s program in Maryland is titled International Relations.
G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes

Curricular Development. The proposed curriculum was developed with a focus on basic and applied research skills through coursework that emphasizes quantitative methods and data sets along with rigorous academic theory and empirical research. The department has strengthened and developed new quantitative and analytic methods coursework for its undergraduate majors with the goal of providing stronger training in those areas so that, upon graduation, majors would have quantitative and analytical skill sets that would serve them in their professional career goals. Given these developments and new areas of strength in the undergraduate major, it was determined that a master’s program that emphasized quantitative and analytical training would both further support the department’s goals and provide an attractive master’s program for current undergraduates.

Faculty Oversight. The Academic Program Director, Paul Huth, Professor of Government and Politics will be responsible for the academic oversight of the program. In addition, program oversight will be provided by the department's Director of Undergraduate Studies, who will collaborate with the Academic Program Director in the recruitment and selection of instructors for the program. Further, the Government and Politics department chair will conduct a review of the program every three years starting in fall 2024. Finally, the Academic Program Director will form an Advisory Committee that includes three Government and Politics tenure-track and professional-track faculty. The Advisory Committee will meet with the Academic Program Director annually to review the program and its performance.

Educational Objectives, Learning Outcomes, and Assessment. Learning outcomes for the program are organized under four areas of education objectives.

1. Theory in International Relations.

Outcome A: Students will be able to articulate the central theoretical approaches to studying international political economy, international security, and international law and institutions as well as debates among researchers regarding the strengths and weaknesses of different theoretical approaches.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, and in-class written final exam.

Outcome B: Students will be able to identify and apply different international relations theoretical approaches that can be drawn upon to study research questions and to assess how useful different theoretical approaches are to studying a given research question.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, short research design paper, and in-class written final exam.

2. Quantitative Methods for International Relations.
Outcome A: Students will be able to interpret and explain quantitative empirical findings on international political economy, international security, and international law and institutions as well as debates among researchers regarding the strengths and weaknesses of these empirical studies.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, and in-class written final exam.

Outcome B: Students will be able to demonstrate knowledge of the strengths and weaknesses of quantitative studies of international relations.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, and in-class written final exam.

3. Statistical Modeling

Outcome A: Students will be able to demonstrate knowledge of different statistical models that can be used to test theories and hypotheses on international relations and the advantages and limitations of alternative statistical models.

Assessment Methods: Weekly seminar discussion contributions, weekly completion of assigned problem-sets on statistical models, short research design paper, and in-class written final exam.

Outcome B: Students will be able to interpret and provide examples of the datasets used to study international political economy, international security, and international law and institutions as well as debates among researchers regarding the strengths and weaknesses of these datasets.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, and in-class written final exam.

Outcome C: Students will be able to explain which international relations datasets are potentially more or less useful for addressing research questions.

Assessment Methods: Weekly seminar discussion contributions, short paper assignments focused on student evaluation of assigned readings, and in-class written final exam.

4. Quantitative Research Designs

Outcome A: Students will be able to demonstrate knowledge of the fundamental principles, theories, and concepts involved with quantitative research designs used to study research questions in international relations.
Assessment Methods: Weekly seminar discussion contributions, weekly completion of assigned problem-sets on statistical models, short research design paper, and in-class written final exam.

Additional Learning Outcomes Assessment through the Capstone Project:

A faculty committee that oversees the program will develop a rubric that will be used annually to assess students’ overall mastery of the four learning outcomes listed above based on a capstone research paper completed by students in one of the final three courses taken (GVPT 729, 808, 879). The capstone paper will require students to demonstrate each of the four learning outcomes described above in a research design paper that lays out carefully a plan of study to address an international relations research question, including theoretical framework, datasets to be used, measurement of variables, and appropriate statistical methods.

The rubric will contain categories related to specific learning outcomes and students will be assessed as “Advanced,” “Proficient,” “Developing” or “Novice” in each category. The individual categories will be aggregated to produce an overall score. The program will be successful if 80% of the students fall in the “Advanced” or “Proficient” categories on the learning outcomes assessed. The results of this annual assessment will be used by the advisory faculty committee to the Academic Program Director to recommend changes and improvement in the general curriculum as well as the content of specific courses.

Course requirements. The program requires the following ten three-credit courses:

- GVPT604 Introduction to War and Armed Conflict 3 Credits
- GVPT605 Introduction to Conflict and Cooperation in World Economy 3 Credits
- GVPT606 Introduction to International Law and Institutions 3 Credits
- GVPT622 Quantitative Methods for Political Science 3 Credits
- GVPT708 Seminar in International Relations Theory 3 Credits
- GVPT729 Special Topics in Quantitative Political Analysis 3 Credits
- GVPT761 International Political Economy 3 Credits
- GVPT803 Seminar in International Political Organization 3 Credits
- GVPT808 Selected Topics in Functional Problems in International Relations 3 Credits
- GVPT879 Topics on International Security 3 Credits

Total Credits 30

Specific course information is included in Appendix A.

General Education. N/A

Accreditation or Certification Requirements. There are no specialized accreditation or certification requirements for this program.

Other Institutions or Organizations. No contracts with another institution or non-collegiate organization for this program are anticipated at the start of the program.
**Student Support.** As mentioned above, UMD’s Office of Extended Studies provides streamlined administrative support for professional graduate programs across the campus. The Office of Extended Studies Student and Program Services will provide support for admissions, scheduling, registration, billing and payment, graduation, and appeals. Additionally, the college of Behavioral and Social Sciences’ Office of International and Executive Programs will provide support for international students, including marketing, admissions assistance, travel and immigration information, orientation, advising, and other general support.

**Marketing and Admissions Information.** The program will be clearly and accurately described in the university website and be marketed at university recruiting events. Administrative support for the program will be provided centrally by the Office of Extended Studies, which maintains a website for all of its professional and continuing education degree programs.

**H. Adequacy of Articulation**

N/A

**I. Adequacy of Faculty Resources**

*Program faculty.* Faculty expertise will be drawn from the Department of Government and Politics. Faculty biographies for those currently expected to teach in the program are in Appendix B.

*Faculty training.* The university offers numerous opportunities for faculty training and support in the classroom, through the Teaching and Learning Transformation Center (TLTC), workshops by the Office of Faculty Affairs, and by the Division of Information Technology’s Learning Technology Design group. Both the TLTC and the Learning Technology Design group also provide workshops and support in pedagogy and technology for the delivery of online components for any courses.

**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 Department of Government and Politics’ existing facilities, infrastructure, and equipment are adequate to support this program. All students have access to the UMD email system.

**L. Adequacy of Financial Resources**

Resources for the new program will be drawn from existing instructional resources in the department, from tuition and fee revenue, and from an initial investment of reallocated funds
from the university. The program is designed to be self-sustaining after the initial investment to start the program. See Tables 1 and 2 for a five-year estimate of 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 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

The Department of Government and Politics and the College of Behavioral and Social Sciences are committed to recruiting and retaining members of minority groups and increasing the graduation rates of diverse student populations. Further, the department and college are committed to supporting students and ensuring a fear-free, inclusive space where all students can thrive. This includes recognizing non-binary gender identifications, as well as the difference between assigned biological sex and gender expression and encouraging students, faculty, and staff to share and honor preferred pronouns and names. Faculty and staff for the proposed program will work closely with the college's Assistant Dean for Diversity, Kim Nickerson, to develop programs and strategies to advance its diversity objectives. The department’s intention is for the program to be part of a combined bachelor’s/master’s program. Accordingly, the program will work with UMD’s Office of Undergraduate Admissions (OUA), which employs multiple strategies when recruiting a diverse population to apply to UMD. A department representative will work with OUA admissions counselors to provide information about the combined program to prospective students in order to encourage students to apply to the university, enroll in the Government and Politics major, and consider continuing on to the master’s program.

O. Relationship to Low Productivity Programs Identified by the Commission

N/A

P. Adequacy of Distance Education Programs

N/A
Table 1: Expenditures

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<th>Expenditure Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<tr>
<td>1. Faculty (b+c below)</td>
<td>$79,800</td>
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<td>$282,199</td>
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<td>b. Total Salary</td>
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<td>$212,180</td>
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<td>c. Total Benefits</td>
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<td>$54,384</td>
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<td>$72,120</td>
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<td>2. Admin. Staff (b+c below)</td>
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<td>b. Total Salary</td>
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<td>$108,150</td>
<td>$111,395</td>
<td>$114,736</td>
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<td>$35,690</td>
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<td>3. Total Support Staff (b+c below)</td>
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<td>$70,550</td>
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<td>b. Total Salary</td>
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<td>$8,498</td>
<td>$17,505</td>
<td>$18,030</td>
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<td>4. Graduate Assistants (b+c)</td>
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<td>$77,341</td>
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<td>b. Stipend</td>
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<td>$84,872</td>
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<td>c. Tuition Remission</td>
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<td>$74,450</td>
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<td>5. Equipment</td>
<td>$5,000</td>
<td>$5,000</td>
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<td>6. Library</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$5,000</td>
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<td>7. New or Renovated Space</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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<td>$0</td>
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<tr>
<td>8. Other Expenses: Operational Expenses</td>
<td>$35,000</td>
<td>$35,000</td>
<td>$40,000</td>
<td>$40,000</td>
<td>$40,000</td>
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<tr>
<td><strong>TOTAL (Add 1 - 8)</strong></td>
<td><strong>$279,688</strong></td>
<td><strong>$519,612</strong></td>
<td><strong>$710,226</strong></td>
<td><strong>$730,032</strong></td>
<td><strong>$750,433</strong></td>
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</table>

Other expenses include materials and supplies, marketing, international travel, and administrative support from the campus.
### Table 2: Resources

<table>
<thead>
<tr>
<th>Resources Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reallocated Funds</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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<tr>
<td>2. Tuition/Fee Revenue (c+g below)</td>
<td>$205,860</td>
<td>$819,441</td>
<td>$1,184,258</td>
<td>$1,225,475</td>
<td>$1,268,212</td>
</tr>
<tr>
<td>a. # FT Students</td>
<td>5</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>b. Annual Tuition/Fee Rate</td>
<td>$28,272</td>
<td>$29,120</td>
<td>$29,994</td>
<td>$30,894</td>
<td>$31,820</td>
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<tr>
<td>c. Annual FT Revenue (a x b)</td>
<td>$141,360</td>
<td>$582,403</td>
<td>$899,813</td>
<td>$926,807</td>
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<tr>
<td>d. # PT Students</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<tr>
<td>e. Credit Hour Rate</td>
<td>$1,075.00</td>
<td>$1,128.75</td>
<td>$1,185.19</td>
<td>$1,244.45</td>
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<tr>
<td>f. Annual Credit Hours</td>
<td>12</td>
<td>21</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>g. Total Part Time Revenue (d x e x f)</td>
<td>$64,500</td>
<td>$237,038</td>
<td>$284,445</td>
<td>$298,667</td>
<td>$313,601</td>
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<tr>
<td>3. Grants, Contracts, &amp; Other External Sources</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>4. Other Sources</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>TOTAL (Add 1 - 4)</strong></td>
<td>$205,860</td>
<td>$819,441</td>
<td>$1,184,258</td>
<td>$1,225,475</td>
<td>$1,268,212</td>
</tr>
</tbody>
</table>

Full-time tuition revenue is based on a mix of resident and non-resident graduate full-time rates, due to the intended partnership with an international university to create a student cohort. Part-time revenue is based on a flat rate for planning purposes. Any rate other than the resident/non-resident rate will require approval by the University’s Finance Committee.
### Appendix A: Courses

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Title</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVPT 604* 3 Credits</td>
<td>Introduction to War and Armed Conflict</td>
<td>This seminar examines major theories of both international and civil wars and reviews major empirical studies that test theories of conflict. The topics include the onset of armed conflict, the duration and outcomes of wars, and the durability of peace in the aftermath of wars. The focus is on developing an understanding of central debates in the literature and primary empirical findings from quantitative and cross-national analyses.</td>
</tr>
<tr>
<td>GVPT 605* 3 Credits</td>
<td>Introduction to Conflict and Cooperation in the World Economy</td>
<td>This seminar examines major theoretical approaches and empirical studies of international political economy, contemporary dynamics of globalization, the role of domestic politics in the formation of foreign economic policies of states, the dynamics of international trade and investment disputes, and role of international institutions in multi-lateral governance of the world economy. The focus is on developing an understanding of central debates in the literature and primary empirical findings from quantitative and cross-national analyses.</td>
</tr>
<tr>
<td>GVPT 606* 3 Credits</td>
<td>Introduction to International Law and Institutions</td>
<td>This seminar examines major theoretical approaches and empirical studies of international law and institutions relating to international political economy and international security. Topics to be covered include the sources of international law and the development of core legal principles in the post-WWII era, the role of international economic institutions such as WTO, IMF, and World Bank in the global economy, and the influence of international institutions such as the UN Security Council, World Court, and International Criminal Court in addressing international security issues. Larger questions about the effectiveness of the WTO, Laws of War, and International Human Rights Law will be considered. The focus is on developing an understanding of central debates in the literature and primary empirical findings from quantitative and cross-national analyses.</td>
</tr>
<tr>
<td>GVPT 708 3 Credits</td>
<td>Seminar in International Relations Theory</td>
<td>This course will focus on central theoretical and analytical approaches to understanding how domestic and international factors influence and shape both the foreign policy goals pursued by national leaders and how these same factors affect the ability of such leaders to achieve their foreign policy goals. Theoretical approaches to studying international political economy, international security, and international law and institutions will be emphasized.</td>
</tr>
<tr>
<td>GVPT 761 3 Credits</td>
<td>International Political Economy</td>
<td>This course examines central theoretical and empirical studies of international trade, finance, and investment as well as topics such as multinational corporation relations with host countries, the relationship of domestic politics to foreign economic policy, patterns of globalization, and key legal principles relating to IPE. Throughout the course emphasis will be given to the importance of political and strategic factors in shaping and influencing international economics.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>GVPT 803</td>
<td>3 Credits</td>
<td>Seminar in International Political Organization</td>
</tr>
<tr>
<td>GVPT 808</td>
<td>3 Credits</td>
<td>The Impact of International Economics and Security on Developing Countries</td>
</tr>
<tr>
<td>GVPT 622</td>
<td>3 Credits</td>
<td>Quantitative Methods of Political Science</td>
</tr>
<tr>
<td>GVPT 729</td>
<td>3 Credits</td>
<td>Quantitative Analyses of International Political Economy and International Security</td>
</tr>
<tr>
<td>GVPT 879</td>
<td>3 Credits</td>
<td>The Political Economy of International Power and Security Policy</td>
</tr>
</tbody>
</table>

*Course will be added through the university course approval process after the program is approved.*
Appendix B: Faculty

Instructor Pool: Titles, Credentials, & Courses

Todd Allee: PhD, Associate Professor of Government and Politics: international political economy, international law and institutions. Full-time.
- Courses: GVPT605, 606, 708, 761, 729, 803

Virginia Haufler: PhD, Associate Professor of Government and Politics: international political economy, international law and institutions. Full-time.
- Courses: GVPT605, 606, 761

Sarah Croco: PhD, Associate Professor of Government and Politics: international conflict and security, quantitative methods and analysis. Full-time.
- Courses: GVPT604, 622, 708, 729, 761

Stacy Kosko: PhD, Associate Research Professor, Government and Politics/Center for International Development and Conflict Management: political economy of development, international law and institutions. Full-time.
- Courses: GVPT605, 606, 808

David Backer: PhD, Research Professor, Government and Politics/Center for International Development and Conflict Management: political economy of development, quantitative methods and analysis. Full-time.
- Courses: GVPT729, 808

Kelly Wong: PhD, Assistant Research Scientist, Government and Politics/Center for International Development and Conflict Management: political economy of development. Full-time.
- Courses: GVPT808

- Courses: GVPT604, 622, 729, 879

Deniz Cil: PhD, Post-Doctoral Associate Government and Politics/Center for International Development and Conflict Management: international conflict and security, international law and institutions, quantitative methods and analysis. Full-time.
- Courses: GVPT604, 606, 708, 729, 803, 879

Eric Dunford, PhD, Assistant Teaching Professor, Georgetown University: quantitative methods and analysis. Part-time.
- Courses: GVPT622, 729.
  - Courses: GVPT605, 622, 729, 808

Andrew Lugg: PhD summer 2020 Government and Politics: international political economy, international law and institutions. Part-time.
  - Courses: GVPT605, 761, 803

  - Courses: GVPT729, 808
TOPIC: University of Maryland, College Park: Master of Science in Applied Political Analytics

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 6, 2020

SUMMARY: The University of Maryland, College Park (UMD) proposes to establish a Master of Science in Applied Political Analytics. This program will prepare students for careers at the intersection of political science and data science. Empirical analysis in political science is entering a new era of Big Data, in which a broad range of data sources have become available to researchers. Examples include network data from political campaigns, data from social media generated by individuals, campaign contributions and lobbying expenditures made by firms and individuals, and international trade flows data.

The program will be jointly offered by UMD’s Department of Government and Politics (GVPT) and its Joint Program in Survey Methodology (JPSM). The curriculum consists of 12 three-credit courses (36 credits total). Eighteen (18) credits will be provided by GVPT, and 18 credits will be provided by JPSM.

Whether it is understanding which message to use to encourage a citizen to register to vote or what services are needed to support programs to reduce radicalization among at-risk youth, data driven strategies are a key to success. Graduates will understand the core questions of political science and have a sophisticated understanding of empirical research techniques to answer those questions. The program will prepare students for careers in the private sector; research centers; NGOs; and federal, state, and local government agencies.

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

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

CHANCELLOR’S RECOMMENDATION: That the Committee on Education Policy and Student Life recommend that the Board of Regents approve the proposal from the University of Maryland, College Park to offer the Master of Science in Applied Political Analytics.

COMMITTEE RECOMMENDATION:  DATE:

BOARD ACTION:  DATE:

SUBMITTED BY: Joann A. Boughman  301-445-1992  jboughman@usmd.edu
February 3, 2020

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 Science program in Applied Political Analytics. 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,

Wallace D. Loh
President

cc: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs
Mary Ann Rankin, Senior Vice President and Provost
Gregory Ball, Dean, College of Behavioral and Social Sciences
UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

- New Instructional Program
- Substantial Expansion/Major Modification
- Cooperative Degree Program
- Within Existing Resources, or
- Requiring New Resources

University of Maryland, College Park
Institution Submitting Proposal

Applied Political Analytics
Title of Proposed Program

Master of Science
Award to be Offered

Fall 2020
Projected Implementation Date

220701
Proposed HEGIS Code

45.1099
Proposed CIP Code

Government and Politics
Department in which program will be located

William Reed
Department Contact

301-405-4156
Contact Phone Number

wfr@umd.edu
Contact E-Mail Address

February 3, 2020
Date

Signature of President or Designee
A. Centrality to the University's Mission and Planning Priorities

Description. The University of Maryland, College Park (UMD) proposes to establish a Master of Science in Applied Political Analytics. This program will prepare students for careers at the intersection of political science and data science. Empirical analysis in political science is entering a new era of Big Data, in which a broad range of data sources have become available to researchers. Examples include network data from political campaigns, data from social media generated by individuals, campaign contributions and lobbying expenditures made by firms and individuals, and international trade flows data. The program will be jointly offered by UMD’s Department of Government and Politics (GVPT) and its Joint Program in Survey Methodology (JPSM). GVPT will provide coursework in the foundations of political science, while JPSM will provide coursework in the technical aspects of data collection, survey methods, and statistical modeling. This interdisciplinary program aligns with UMD’s mission as “a strong proponent of interdisciplinary education and collaboration . . . at the forefront of advanced knowledge in areas that increasingly depend on multi-disciplinary approaches, including energy, the environment, health, climate change, food safety, security, and information sciences.”1 People planning to work in the area of applied political analytics need two different sets of skills. They must have the technical background to work with data sets of an order of magnitude unimaginable to previous generations. Developing and working with social and behavioral data presents unique challenges in measurement design, data collection, ethics and governance, communication, data management, modeling, and analysis. They must also have a rich background in political science so that they can meaningfully apply these analytical skills to important policy questions and issues.

Relation to Strategic Goals. Among UMD’s strategic goals for graduate education is to provide advanced education for the professional workforce and to prepare graduate students to be leaders in their fields. As stated in UMD’s Strategic Plan, “The University will maintain excellent professional graduate programs that are nationally recognized for their contributions to the practice of the professions, for their forward-looking curricula, and for their spirit of innovation and creativity.”2 The program provides advanced training in the application of data science to the analysis of key issues in political science. Graduates will be well prepared for careers in the private sector, research centers, NGO’s, and federal, state, and local government agencies. Whether it is understanding which message to use to encourage a citizen to register to vote or what services are needed to support programs to reduce radicalization among at-risk youth, data driven strategies are a key to success. Graduates will understand the core questions of political science and have a sophisticated understanding of empirical research techniques to answer those questions.

Funding. Resources for the new program will be drawn primarily from tuition revenue, but also initially from reallocated funds from within the university.

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Institutional Commitment. The program will be jointly offered by GVPT and JPSM. UMD’s Office of Extended Studies, which provides streamlined administrative support for professional graduate programs across the campus, will provide administrative support for the program. In the event that the program is discontinued, the courses will be offered for a reasonable time period so that enrolled students can finish the program. The faculty and administrative infrastructure will still be in place to work with students who have not finished the program.

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

Need. Prospective students in the state of Maryland’s Washington, D.C., suburbs are drawn to the many political opportunities in the D.C. area. Their plans might include, for example, positions on Capitol Hill or in an NGO such as the World Bank or International Monetary Fund, a research organization such as the Brookings Institution, a political campaign, or one of the federal agencies. Many, however, will find it difficult to stand out in a crowded job market. And the market is indeed crowded; each year US colleges and universities grant degrees to more than 160,000 undergraduates who majored in one of the social sciences or history. The proposed program will give students valuable marketable skills that will give them a significant competitive advantage in the Washington market.

State Plan. As noted in strategy 8 of the Maryland State Plan for Postsecondary Education, “More than ever, employers seek employees who have the flexibility to understand changing conditions and solve emerging problems.” This program reflects the call for innovation in the Maryland State plan by providing students with the skills and abilities to further their understanding of government and politics through empirical research and data analytics. Students will go beyond the empirical training of traditional political science programs by delving more deeply into research design, statistical methods, data collection, questionnaire design and evaluation, computing and data display, and inference.

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

Both the U.S. Bureau of Labor Statistics (BLS) and the Maryland Department of Labor predict job growth for political scientists. The U.S. prediction is 5% growth between 2018 and 2028, and Maryland predicts 6.3% between 2016 and 2026. More telling, however, is the significant rise in data science positions that is expected. A BLS report entitled, “Big Data Adds Up to Opportunities in Math Careers,” indicates that data science positions are poised to increase

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The report indicates that jobs for statisticians are projected to increase 33.8% between 2016 and 2026. For this reason, GVPT and JPSM anticipate that jobs for political scientists with advanced data-science skills will be much higher than the 5-6% increase predicted by the US and the State of Maryland for political scientists.

In March 2018, the Department of Government and Politics distributed a survey to GVPT undergraduate majors enrolled in 300 and 400-level courses (586 unique students) asking about their interest in a program like the one proposed here. Eighty-six students took the survey, with 63 completing all questions. The students were primarily juniors (38%) and seniors (33%). Respondents were asked to rate the importance of a set of skills to achieving their career objectives, including data analysis, research design, questionnaire design, public speaking, and writing. The majority of students recognized data analysis and research design skills; the core components of the proposed program as important for their career objectives. With regard to data analysis skills, 46% of the respondents indicated these skills were "extremely important" and another 24% said they were "very important." Additionally, 39% responded that research design was extremely important, with another 31% indicating these skills were "very important." GVPT also asked respondents about the likelihood that they would enroll in a graduate program in political analytics. Seniors were asked how likely they would have been to enroll; the other respondents were asked how likely they would be to enroll. Thirty-seven percent of the respondents indicated they would be "very likely" to enroll; 38% said "somewhat likely" and 14% were undecided. Overall, this survey suggests that GVPT students see gaining data analysis skills as important to their career objectives and are interested in a graduate program like the MS in Political Analytics. GVPT and JPSM plan to launch a combined bachelor's/master's program for Government and Politics undergraduates and the Applied Political Analytics master's program once the MS program is approved. UMD has more than 800 students enrolled in its Government and Politics undergraduate program.

D. Reasonableness of Program Duplication

Only one master's program among Maryland institutions has a comparable title: Johns Hopkins University's Master of Science in Government Analytics. The Hopkins program is primarily online, whereas the proposed program will be taught in a face-to-face format on UMD's College Park campus. Furthermore, as indicated above, a sufficient student population exists within UMD's own undergraduate program to warrant the program's establishment.

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

According to MHEC's online academic program inventory, no HBI currently offers a program that combines government and politics with data analytics.

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

UMD has already established itself in the field of government and politics through the GVPT department and in data analytics as applied to the social sciences through the research and

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teaching activities of JPSM. UMD already offers master’s and doctoral programs in Government and Politics, Survey Methodology, and Survey Statistics. Accordingly, the proposed program would not have an impact on the uniqueness or institutional identity of any Maryland HBI.

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

Curricular Development. Both of the academic units involved in developing this program have seen their fields evolve as data analytics becomes more pervasive. The field of political science has become increasingly quantitative, and GVPT has in recent years added several courses focused on the analysis of data related to political questions. These courses have become quite popular with GVPT undergraduate students as they see that these courses provide clear skills that are attractive to employers. GVPT alumni have indicated in several cases that they have gotten jobs based on the skills they acquired in these types of classes. In the spring of 2018, GVPT had an external review and the external review committee commended the department in its strength in undergraduate instruction in political methodology and encouraged further development in that area.

JPSM is the nation’s oldest and largest program originally focused on offering graduate training in the principles and practices of survey research. Over the last few years the scope within JPSM has grown to include administrative data and other digital traces. Studying errors and biases in the process of collecting such data, creating measurements from those data, and developing methods to analyze these data by themselves and in conjunction with survey data is now an added focus.

Both units understand that employers across the government, private, and non-profit sectors increasingly understand that data can help them reach their organizations' goals. In the campaign world alone, the last several election cycles have seen a proliferation of new companies specializing in data analytics and existing firms adding capacity in this area. In order to be most effective, however, the workforce needs more than just technical skills. That is, with a firm foundation in the theoretical and empirical research the most successful employees will be able to communicate more effectively with clients and adapt to new questions and issues as they arise. As a result, the program curriculum bridges a rigorous theoretical background in political science with a deeper and expanded skill set in data science.

Faculty Oversight. GVPT and JPSM will choose a program director from their tenured faculty. The GVPT director of graduate studies will initially serve as director. The units will also form an advisory board for the program that will include at least one faculty member from GVPT and one faculty member from JPSM, a current student in the program, and one or more members from outside the university. The outside members will be from institutions that employ people with the skills and background of the graduates of the proposed program.

Learning Outcomes and Assessment. The proposed curriculum has been designed to meet five outcomes:

1. Provide a more rigorous theoretical background in at least one major sub-field in political science.
2. Enhance a student's existing understanding of political analysis (from undergraduate coursework) with a rigorous introduction to additional analytical tools.
3. Provide a venue for students to practice theoretically rigorous political analysis with their expanded tool set.
4. Provide a rigorous understanding of the fundamentals of data science.
5. Introduce students to the key tools of Big Data collection, management, and analysis.

In one of the substantive political science courses the students will take toward the end of the program (Public Opinion, Voting, Campaigns, and Elections, The Logic and Practice of Measurement, and National Security and International Relations), they will complete a major final project that demonstrates each of these skills. We will assess all student's achievement of these learning outcomes each year.

A faculty committee that oversees the Master of Science in Applied Political Analytics program, led by a full professor, will develop rubrics that will be used to assess student mastery of each of these learning objectives. Faculty members will then use the rubric to assess each major project produced in each academic year. The rubric will contain categories related to the specific learning outcome and students will be assessed as "Advanced," "Proficient," "Developing" or "Novice" in each category. The individual categories will be aggregated to produce an overall score. Our overall goal is that 80% of the students are scored as "Advanced" or "Proficient" on the learning outcome assessed.

This assessment will be conducted annually. The program will assess one to two learning outcomes per year, and every outcome will be assessed at least every four years.

The results of this assessment will be discussed in the faculty committee, as well as among the faculty of GVPT and JPSM. GVPT and JPSM will use this discussion to continually improve the overall curriculum and the content of the specific courses offered within the MS degree to enhance student learning.

Course requirements. The program requires the following twelve three-credit courses:

GVPT6XX Research Design for Political Analytics 3 Credits
GVPT6XX Voting, Campaigns, and Elections 3 Credits
GVPT6XX Coding in Statistical Software 3 Credits
GVPT6XX Public Opinion 3 Credits
GVPT6XX The Logic and Practice of Measurement 3 Credits
GVPT6XX National Security and International Relations 3 Credits
SURV615 Statistical Modeling I 3 Credits
SURV616 Statistical Modeling II 3 Credits
SURV621 Fundamentals of Data Collection I 3 Credits
SURV630 Questionnaire Design and Evaluation 3 Credits
SURV727 Fundamentals of Computing and Data Display 3 Credits
SURV740 Fundamentals of Inference 3 Credits
Total Credits: 36
GVPT will develop six new courses for the program (the as yet unnumbered GVPT6XX courses listed above), and JPSM will offer six courses that have already been developed. Specific course information is included in Appendix A.

**General Education.** N/A

**Accreditation or Certification Requirements.** There are no specialized accreditation or certification requirements for this program.

**Other Institutions or Organizations.** No contracts with another institution or non-collegiate organization for this program are anticipated at the start of the program.

**Student Support.** UMD’s Office of Extended Studies provides streamlined administrative support for professional graduate programs across the campus. The Office of Extended Studies Student and Program Services will provide support for admissions, scheduling, registration, billing and payment, graduation, and appeals.

**Marketing and Admissions Information.** The program will be clearly and accurately described in the university website and be marketed at university recruiting events. Administrative support for the program will be provided centrally by the Office of Extended Studies, which maintains a website for all of its professional and continuing education degree programs.

**H. Adequacy of Articulation**

N/A

**I. Adequacy of Faculty Resources**

**Program faculty.** Faculty expertise will be drawn from both GVPT and JPSM. Faculty biographies for those currently expected to teach in the program are in Appendix B.

**Faculty training.** The university offers numerous opportunities for faculty training and support in the classroom, through the Teaching and Learning Transformation Center (TLTC), workshops by the Office of Faculty Affairs, and by the Division of Information Technology’s Learning Technology Design group. Both the TLTC and the Learning Technology Design group also provide workshops and support in pedagogy and technology for the delivery of online components for any courses.

**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 existing facilities, infrastructure, and equipment in GVPT and JPSM are adequate to support this program. All students have access to the UMD email system.

L. Adequacy of Financial Resources

Resources for the new program will be drawn from existing instructional resources in GVPT and JPSM, from tuition and fee revenue, and from an initial investment of reallocated funds from within the university. The program is designed to be self-sustaining after the initial investment to start the program. See Tables 1 and 2 for a five-year estimate of 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 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

GVPT, JPSM, and the College of Behavioral and Social Sciences (which houses these two academic units) are committed to the recruitment, retention and professional development among members of minority groups, and to increase graduation rates of diverse student populations. These units will work closely with the college's Assistant Dean for Diversity Kim Nickerson to develop programs and strategies to advance the program's diversity objectives. The diversity plans, for example, will include the following:

- Working closely with campus minority student groups so that students from groups that are underrepresented in political science are aware of the program.
- Developing a program to match students with faculty mentors.
- Reaching out to Historically Black Colleges and Universities and other schools with significant numbers of minority undergraduates.
- Taking advantage of the American Political Science Association's many programs to promote diversity.

GVPT and JPSM are committed to supporting students and ensuring a fear-free, inclusive space where all students can thrive. GVPT and JPSM recognize non-binary gender identifications, as well as the difference between assigned biological sex and gender expression. They encourage students, faculty, and staff to share and honor preferred pronouns and names.
O. Relationship to Low Productivity Programs Identified by the Commission

N/A

P. Adequacy of Distance Education Programs

N/A
Table 1: Expenditures

<table>
<thead>
<tr>
<th>Expenditure Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<tbody>
<tr>
<td>1. Faculty (b+c below)</td>
<td>$104,000</td>
<td>$200,850</td>
<td>$275,834</td>
<td>$284,109</td>
<td>$292,632</td>
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<td>2.0</td>
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<td>b. Total Salary</td>
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<td>$212,180</td>
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<td>c. Total Benefits</td>
<td>$24,000</td>
<td>$46,350</td>
<td>$63,654</td>
<td>$65,564</td>
<td>$67,531</td>
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<td>2. Admin. Staff (b+c below)</td>
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<tr>
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<td>1.0</td>
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<td>b. Total Salary</td>
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<td>$72,100</td>
<td>$74,263</td>
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<td>c. Total Benefits</td>
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<td>3. Total Support Staff (b+c below)</td>
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<td>0.5</td>
<td>0.5</td>
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<tr>
<td>b. Total Salary</td>
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<td>c. Total Benefits</td>
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<td>4. Graduate Assistants (b+c)</td>
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<td>$179,401</td>
<td>$184,783</td>
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<td>b. Stipend</td>
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<td>d. Tuition Remission</td>
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<td>6. Library</td>
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<tr>
<td>8. Other Expenses: Operational Expenses</td>
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<td>$697,908</td>
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</table>

Other expenses include marketing, materials and supplies, travel, and administrative support from the Office of Extended Studies.
Table 2: Resources

<table>
<thead>
<tr>
<th>Resources Categories</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
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<td>1. Reallocated Funds</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>2. Tuition/Fee Revenue (c+g below)</td>
<td>$173,616</td>
<td>$478,635</td>
<td>$702,700</td>
<td>$943,432</td>
<td>$1,078,968</td>
</tr>
<tr>
<td>a. #FT Students</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>b. Annual Tuition/Fee Rate</td>
<td>$21,835</td>
<td>$22,490</td>
<td>$23,165</td>
<td>$23,860</td>
<td>$24,576</td>
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<tr>
<td>c. Annual FT Revenue (a x b)</td>
<td>$109,176</td>
<td>$224,903</td>
<td>$347,474</td>
<td>$477,198</td>
<td>$491,514</td>
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<tr>
<td>d. # PT Students</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>e. Credit Hour Rate per student</td>
<td>$1,074</td>
<td>$1,128</td>
<td>$1,184</td>
<td>$1,243</td>
<td>$1,305</td>
</tr>
<tr>
<td>f. Total Annual Credit Hours</td>
<td>12</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>g. Total Part Time Revenue (d x e x f)</td>
<td>$64,440</td>
<td>$253,733</td>
<td>$355,226</td>
<td>$466,233</td>
<td>$587,454</td>
</tr>
<tr>
<td>3. Grants, Contracts, &amp; Other External Sources</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>4. Other Sources</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>TOTAL (Add 1 - 4)</strong></td>
<td><strong>$173,616</strong></td>
<td><strong>$478,635</strong></td>
<td><strong>$702,700</strong></td>
<td><strong>$943,432</strong></td>
<td><strong>$1,078,968</strong></td>
</tr>
</tbody>
</table>
Appendix A: Courses

*GVPT6xx: Research Design for Political Analytics (3 credits)
This course will introduce students to the empirical research techniques used in political science. Students will explore the core questions that motivate political science research and the approaches used to answer those questions. Students will understand when and how to implement research designs that utilize experiments, surveys, case studies, historical data, and administrative data.

*GVPT6xx: Coding in Statistical Software (3 credits)
This course will introduce students to different statistical software packages used in empirical political research and which they will use in later substantive courses. Students will receive instruction in beginning programming in these packages, which will be STATA and R.

*GVPT6xx: Public Opinion (3 credits)
This course will investigate how citizens in a democracy think about politics, form attitudes, and how public opinion shapes and is shaped by the political environment. While being exposed to core debates in public opinion and the study of public opinion, students will use a number of surveys that have been central to advancing our knowledge of public opinion.

*GVPT6xx: Voting, Campaigns, and Elections (3 credits)
This course will introduce students to the theoretical and empirical research on political participation, campaigns, and elections. By gaining an understanding of the literature and working with a variety of data sets, including surveys and voter history files, students will be equipped to carry out their own research on these topics.

*GVPT6xx: The Logic and Practice of Measurement (3 credits)
This course will introduce students to core concepts necessary to measure political behavior. Students will learn to take ideas from the concept stage to measurement of the concepts as part of a research design to answer theoretically motivated questions about political behavior and other political activity.

*GVPT6xx: National Security and International Relations (3 credits)
This course will introduce students to key areas of research in national security and international relations. Students will learn the major approaches to empirical research on national and international security and work with datasets focused on terrorist attacks and civil conflict.

SURV615: Statistical Methods I (3 credits) The purpose of this class is to learn basic statistical methods through the use of linear model theory and regression. Particular topics covered include one- and two-sample t-tests, multiple linear regression, analysis of variance, regression diagnostics, model-building techniques, random effects models, and mixed models. The emphasis will be to understand and apply the methods presented, and develop a feel for how problems in data analysis can be viewed in several different ways. In all cases the emphasis will be on understanding the techniques, rather than deriving their theoretical properties. The student will be expected to apply the techniques on weekly homework assignments, a midterm project, and a final project.
SURV616: Statistical Methods II (3 credits)
Builds on the introduction to linear models and data analysis provided in Statistical Methods I. Topics include: Multivariate analysis techniques (Hotelling’s T-square, Principal Components, Factor Analysis, Profile Analysis, MANOVA); Categorical Data Analysis (contingency tables, measures of association, log-linear models for counts, logistic and polytomous regression, GEE) and Lifetime Data Analysis (Kaplan-Meier plots, logrank tests, Cox regression).

SURV621: Fundamentals of Data Collection I (3 credits)
This course is the first semester of a two-semester sequence that provides a broad overview of the processes that generate data for use in social science research. Students will gain an understanding of different types of data and how they are created, as well as their relative strengths and weaknesses. A key distinction is drawn between data that are designed, primarily survey data, and those that are found, such as administrative records, remnants of online transactions, and social media content. The course combines lectures, supplemented with assigned readings, and practical exercises. In the first semester, the focus will be on the error that is inherent in data, specifically errors of representation and errors of measurement, whether the data are designed or found. The psychological origins of survey responses are examined as a way to understand the measurement error that is inherent in answers. The effects of the mode of data collection (e.g., mobile web versus telephone interview) on survey responses also are examined.

SURV630: Questionnaire Design and Evaluation (3 credits)
This course focuses on the development of the survey instrument, the questionnaire. Topics include wording of questions (strategies for factual and non-factual questions), cognitive aspects, order of response alternatives, open versus closed questions, handling sensitive topics, combining individual questions into a meaningful questionnaire, issues related to question order and context, and aspects of a questionnaire other than questions. Questionnaire design is shown as a function of the mode of data collection such as face-to-face interviewing, telephone interviewing, mail surveys, diary surveys, and computer-assisted interviewing.

SURV727: Fundamentals of Computing and Data Display (3 credits)
Empirical social scientists are often confronted with a variety of data sources and formats that extend beyond structured and handleable survey data. With the emergence of Big Data, especially data from web sources play an increasingly important role in scientific research. However, the potential of new data sources comes with the need for comprehensive computational skills in order to deal with loads of potentially unstructured information. Against this background, the first part of this course provides an introduction to web scraping and API’s for gathering data from the web and then discusses how to store and manage (big) data from diverse sources efficiently. The second part of the course demonstrates techniques for exploring and finding patterns in (non-standard) data, with a focus on data visualization. Tools for reproducible research will be introduced to facilitate transparent and collaborative programming. The course focuses on R as the primary computing environment, with excursus into SQL and Big Data processing tools.

SURV740: Fundamentals of Inference (3 credits)
The course is designed to overview and review fundamental ideas of making inferences about populations. It will emphasize the basic principles of probability sampling; focus on differences between making predictions and making inferences; explore the differences between randomized study designs and observational studies; consider model-based vs. design-based analytic approaches; review techniques designed to improve efficiency using auxiliary information; and consider non-probability sampling and related inferential techniques.

*Course will be added through the university course approval process after the program is approved.
Appendix B: Faculty

Instructor Pool: Titles, Credentials, & Courses

The GVPT courses will be new and have not yet been assigned. The list below includes potential GVPT faculty who may teach in the program. Some Professional Track (non-tenure track) will be hired for teaching the courses, including some current doctoral students. More than 50% of the faculty will be full-time.

For GVPT-based courses

<table>
<thead>
<tr>
<th>Name</th>
<th>Type of Degree, Year</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liliana Mason</td>
<td>PhD, Pol Sci, 2013; Associate Professor; F/T</td>
<td></td>
</tr>
<tr>
<td>Sarah Croco</td>
<td>PhD, Pol Sci, 2004; Associate Professor; F/T</td>
<td></td>
</tr>
<tr>
<td>Michael Hanmer</td>
<td>PhD, Pol Sci, 2008; Professor; F/T</td>
<td></td>
</tr>
<tr>
<td>Candice Turrito</td>
<td>PhD, GVPT 2018; Consultant; F/T</td>
<td></td>
</tr>
<tr>
<td>Eric Dunford</td>
<td>PhD, GVPT 2018; Assistant Teaching Professor, Georgetown University; F/T</td>
<td></td>
</tr>
<tr>
<td>Trey Billing</td>
<td>PhD expected 2020; Doctoral candidate, PhD expected 2020; P/T</td>
<td></td>
</tr>
<tr>
<td>Ted Ellsworth</td>
<td>PhD expected 2022; Doctoral candidate, PhD expected 2022; P/T</td>
<td></td>
</tr>
<tr>
<td>Michael Cowan</td>
<td>MPP 2014; Doctoral candidate, PhD expected 2022; P/T</td>
<td></td>
</tr>
</tbody>
</table>

The SURV courses have been taught. Although some hiring of professional track faculty may be hired to teach the courses, a pool of existing faculty exist who have taught the courses.

For JPSM-based courses

<table>
<thead>
<tr>
<th>Name</th>
<th>Type of Degree, Year</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frauke Kreuter</td>
<td>PhD, Sociology, 2001; Professor; F/T</td>
<td></td>
</tr>
<tr>
<td>Taylor Lewis</td>
<td>PhD, Survey Methodology, 2014; Adjunct Assistant Professor; F/T</td>
<td>SURV615; SURV616</td>
</tr>
<tr>
<td>Christopher Antoun</td>
<td>PhD, Survey Methodology, 2015; Assistant Research Professor; F/T</td>
<td>SURV621</td>
</tr>
<tr>
<td>Yan Li</td>
<td>PhD, Survey Methodology, 2006; Professor; F/T</td>
<td>SURV740</td>
</tr>
<tr>
<td>Frederick Conrad</td>
<td>PhD, Cognitive Psychology, 1986; Professor, University of Michigan, Associate Research Professor, UMD; F/T</td>
<td>SURV621</td>
</tr>
<tr>
<td>Michael Elliott</td>
<td>PhD, Biostatistics, 1999; Research Professor; F/T</td>
<td>SURV740</td>
</tr>
<tr>
<td>Ting Yan</td>
<td>PhD, Survey Methodology, 2005; Assistant Research Professor; F/T</td>
<td>SURV630</td>
</tr>
<tr>
<td>Christoph Kern</td>
<td>PhD, Political Science, 2016; Assistant Research Professor; F/T</td>
<td>SURV727</td>
</tr>
</tbody>
</table>
F/T= Full time. P/T= Part time.
TOPIC: Update: P-20 Initiatives

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 6, 2020

SUMMARY: Traditionally, the Board of Regents receives an update on highlights of USM’s P-20 initiatives every spring. The P-20 work in the Office of Academic and Student Affairs encompasses partnerships between USM, USM institutions, community colleges, independent universities, and the Maryland Public Schools (P-12). The USM P-20 Office serves as a central point of contact for the education segments--P-12 schools, community colleges, universities--to collaborate on shared objectives of building seamless educational experiences for students from pre-kindergarten through college and career.

P-20 initiatives that are reflected in the following materials and/or will be addressed during today’s presentation include:

- Maryland Center for Computing Education
- State-wide initiative to reduce students’ time in developmental and remedial math courses and accelerate their time to degree
- Civic Education and Civic Engagement
- B-Power
- Teacher Education

This annual report also includes a summary of the recommendations of the Kirwan Commission that are directly relevant to higher education, a report from the Governor’s P-20 Leadership Council, and information on USM’s participation in the National Association of System Heads.

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR’S RECOMMENDATION: This is an information item.

COMMITTEE RECOMMENDATION: Information Only

DATE: March 6, 2020

BOARD ACTION:

DATE:

SUBMITTED BY: Joann Boughman  301-445-1992 jboughman@usmd.edu
Traditionally, the Board of Regents receives an annual update on highlights of USM’s P-20 initiatives every spring. The P-20 work in the Office of Academic and Student Affairs encompasses partnerships between the USM office, USM institutions, community colleges, independent universities, and the Maryland Public Schools. The USM P-20 Office serves as the central point of contact for the education segments—P-12 schools, community colleges, universities—to collaborate on shared objectives of building seamless educational experiences for students from pre-kindergarten through college and career.

**MCCE: Maryland Center for Computing Education**
We are a year and a half into the work that was initiated by HB281 in 2018. MCCE is tasked with providing support for computer science education in P-12, including outreach to the school districts, creation of summer professional development programs for teachers, and collaborative standard setting and curriculum development for computer science integration in schools and in teacher preparation programs. In summer 2019, we offered professional development for over 400 Maryland teachers, while assisting all Maryland school systems to develop and implement their plans for making computer science opportunities available to all students in the state (attachment).

To date we have granted $678,236 directly to Local School Systems (LSS) and spent $258,486 to provide statewide support for P-12 in the form of statewide professional development (PD) workshops, facilitators for local professional development, and online mentoring.

In addition, to date, we have granted $555,989 to higher education institutions that are developing teacher preparation programs to support computer science teaching. We spent $10,780 to provide expert facilitators and statewide collaboration and PD opportunities to support our higher education institutions.

Amounts spent on P-12 and higher education in support of computer science education

<table>
<thead>
<tr>
<th></th>
<th>Direct Grants</th>
<th>Statewide Support Costs of PD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local school systems/ P-12</td>
<td>$678,236</td>
<td>$258,486</td>
<td>$936,722</td>
</tr>
<tr>
<td>Higher Education</td>
<td>$555,989</td>
<td>$10,780</td>
<td>$566,769</td>
</tr>
</tbody>
</table>

**State-wide initiatives to reduce students’ time in developmental and remedial math courses and accelerate their time to degree**

First in the World Maryland Mathematics Reform Initiative (FITW-MMRI)
USM received a four-year, three-million-dollar grant from the U.S. Department of Education in 2015. The grant directly addresses the problem of too many undergraduate students placing into non-credit developmental and remedial mathematics courses. In collaboration with seven community colleges and five USM institutions, USM has supported the development of high-quality statistics pathways that accelerates students’ progress through their general education.
required mathematics courses. We now have results from the first cohort of students who completed the innovative math pathway, and the outcomes exceeded our expectations. The evaluation of the first cohort of a matched-sample of 1,200 students in 10 different institutions showed that students in the new pathways courses passed at a statistically significant higher rate than students in traditional college algebra courses (70.5% compared to 56.5%). 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 new pathways course than the traditional course. While white students have higher pass rates in developmental courses than students of color, nationwide, that trend did not hold true in the newly implemented developmental pathways courses: students of color were as likely to be successful as white students. Additionally, Pell grant-eligible students were just as likely to be successful in the new courses as non-eligible students.

In January 2020, USM published a monograph containing eight chapters, written by four USM institutions (Coppin State University, Towson University, UMBC, and University of Maryland Global Campus), four community colleges (Anne Arundel Community College, Harford Community College, Howard Community College, and Montgomery College), and one affiliate public four-year university (Morgan State University), recounting their experiences with implementing mathematics reforms as part of the Maryland Mathematics Reform Initiative. The institutions described their efforts to redesign developmental courses, better align developmental and transfer-level courses, facilitate inter- and intra-institutional communication and collaboration, and improve placement practices. (Attachment: Reforming Mathematics in Maryland: Stories from the Journey)

Maryland Mathematics Alignment Project (MMAP)
This 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). That work is just beginning, and the first meeting of the MMAP Task Force was held on January 29, 2020.

Strong Start to Finish: Placement Collaboration
Strong Start to Finish (SSTF) is an initiative of the Education Commission of the States focused on increasing the number of students completing their first credit-bearing math and English courses in their first year of study. In February 2020, USM applied to SSTF for funding to begin statewide collaboration on creating a fairer and more streamlined process for assessing students’ readiness for college level mathematics. The USM project is called Multiple Placement Measures for Maryland (MPM2) and, if funded, will provide us with an opportunity to do research to better understand the best predictors of student success in college-level math classes.

Civic Education and Civic Engagement Update
USM hosted the first annual Civic Engagement and Civic Education (CECE) Workshop on November 8, 2019 (full report presented at the November meeting of the Committee on Education Policy and Student Life). Subsequently, on February 12, 2020, two USM institutions were awarded the highly-prestigious Carnegie Community Engagement Classification: Salisbury University and University of Maryland, Baltimore County. Campus teams are working on
diverse follow-up activities based on plans developed at the CECE workshop. In Spring 2020, USM will be bringing campus representatives (students, faculty, and staff) together to review campus plans and begin for a fall 2020 convening.

**B-Power Update**

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 and has expanded the program again this year. Dual enrollment headcount at UB has grown twentyfold since 2016, and the number of partner high schools and community-based partners increased tenfold. Growth also included the participation of middle school students in the College Readiness Academy for the first time and now reaching nearly every eligible public high school in Baltimore with B-Power dual enrollment. Given the evidence of success of this program, in 2020, the University System of Maryland will continue to provide funding to UB for B-Power.

**Teacher Education Enhancement Funding Request Update: Request Denied**

The Kirwan Commission has identified teaching and teachers as critical to improving public education in Maryland, and USM provides almost 70% of the Maryland-prepared teachers. Last year, the Chancellor charged a Teacher Workforce Workgroup with examining matters of quantity and quality in producing an appropriate teacher workforce for our state and advising System leadership and the Regents on how the USM can best shape its resources in that effort, in anticipation of the FY2021 Enhancement Request. Dr. DeBrenna Agbenyiga (then-Provost at Bowie State University) and Dr. Laurie Mullen (Dean of Education at Towson University) co-chaired a workgroup composed of all ten USM Education Deans and Directors, USM’s Institutional Research office, and augmented by representatives from the Maryland Independent College and University Association (MICUA), Maryland Association of Community Colleges (MACC), Maryland State Department of Education (MSDE), and Maryland Higher Education Commission (MHEC). USM made a request to the Governor to include $10 million for teacher education as an additional workforce enhancement request, but the request was not included in the Governor’s Budget for 2021. USM will continue to work with the deans of education at USM institutions to support recruitment and retention of students into programs. We will look for external funding, share best practices, and continue to collect evidence to support future enhancement requests.

**P-20: General Topics**

**Kirwan Commission:** This past year’s state P-20 agenda has been dominated by Kirwan Commission recommendations. The Chancellor was the only higher education representative appointed to the 25-member Commission. Last week, the State Legislature took up the Kirwan Commission legislation: Senate Bill 1000/House Bill 1300. Under the legislation, the state would contribute $2.6 billion by fiscal 2030 to local schools, while local jurisdictions would be asked to spend $1.3 billion in the next 10 years. The current legislation identifies three sources of funding for higher education:

- Scholarships for teachers ($2 million in 2021, $4 million in 2022, $8 million in 2023, $12 million in 2024, and for FY2025 and each year thereafter, $18 million (§18-1056);
• Matching funds maximum of $500,000 per year to institutions of higher education that receive grant funding from a non-state source to increase the quality and diversity of applicants for teacher training programs (§6-123 and §17-402); and

• Teacher Collaborative Grant Program (§6-120) to provide funding up to $2.5 million for the development of innovative teacher training practicums. This funding was allocated as part of last year’s budget, and MSDE recently announced three awards: Bowie State University; University of Maryland, College Park; and Morgan State University.

**Governor’s P-20 Leadership Council:** Secretary Tiffany Robinson (Maryland Department of Labor) is the new chair of the P-20 Leadership Council (succeeding Secretary Kelly Schulz). USM representatives on the Council include Chancellor Jay Perman, President Ron Nowaczyk (FSU), President Aminta Breaux (BSU), and Dr. Karen Olmstead (Provost, SU). The Council brings together leaders from all education segments, as well as the business and workforce community, to address policy issues that cross boundaries, such as college and career readiness, workforce shortage areas, teacher quality and quantity, high school/college alignment, and civic education. The Council meets four times a year (P-20 Home Page).

**National Association of System Heads (NASH):** NASH is a national organization, led by Dr. Rebecca Martin, and housed at the USM headquarters in Adelphi. The organization represents 40 Systems in 31 states. USM engages teams of faculty and institutional representatives in NASH initiatives, providing national leadership in strategic areas leading to student success.

*Taking Student Success to Scale* (TS3) is a degree completion initiative led by a collaborative of higher education systems and campuses (NASH Home Page). TS3 interventions include: Redesigned Math Pathways, Predictive Analytics, and Scaling High Impact Practices. USM institutions have embraced these three evidence-based interventions, and NASH supports bringing these interventions to scale across multiple states and university systems.
Kirwan Commission High Level Recommendations

Workgroup 1: Early Childhood Education
• Expand full-day Pre-K at no cost for four-year olds and three-year olds from families with incomes of up to 300% of federal poverty level
• Capacity building for new and current programs (tuition assistance, training new staff)
• Implementation of school readiness assessment
• Expand Judy Centers, Family Support Centers, and Maryland Infants and Toddlers Program

Workgroup 2: High Quality Teachers and Leaders
• Teacher preparation will be much more rigorous, and induction will be expanded
• Raise standards for licensing
• Expand scholarships and loan assistance for highly skilled and diverse candidates
• Raise teacher pay to make it equitable with other highly trained professionals
• Develop career ladders for teachers and school leaders
• Train the State Superintendent and 24 local superintendents with leadership to implement recommendations of the Commission
• Change the way schools are organized and managed to increase amount of time available for teachers to tutor students, mentor teacher candidates, develop curriculum, etc.

Workgroup 3: College and Career Readiness Pathways
• Develop a fully aligned instructional system (curriculum frameworks, course syllabi, assessments, etc.)
• Establish and implement CCR standards set to global standards
• Provide necessary support to students to reach standards in math and literacy
• Revise HS graduation requirements
• Create a new CTE Sub-cabinet to drive a world class CTE System for Maryland (include leaders of industry as well as educators)

Workgroup 4: More Resources for At-Risk Students
• Add a concentrated poverty weight to funding formula to support intensive services for student and families to help them succeed
• Train all staff in all schools to recognized mental health as well as other issues related to trauma, safety, etc.
• Revise funding formula for special education
• Revise funding formula for English Language Learners

Workgroup 5: Governance and Accountability
• Commission will tie meaningful portions of increased funding to evidence that its recommendations are implemented, and greater student success is achieved
• The Advisory Board is charged with oversight and accountability for implementation of the Kirwan Commission Recommendations
• It is not intended to be a replacement for State Board of Education or other existing agencies

This summary of recommendations is for general information only. For a complete list of published recommendations refer to Maryland Commission on Innovation and Excellence in Education Interim Report January 2019
The Maryland Center for Computing Education (MCCE) is designed to expand access to high-quality Pre-Kindergarten-12 (P-12) computing education by strengthening educator skills and increasing the number of Computer Science (CS) teachers in elementary and secondary education.

MCCE serves as a focal point for broader collaborative initiatives to increase the availability and quality of P-12 computing education across the state, including stakeholder meetings and partnerships; teacher certification efforts; standards and curriculum development; innovative pedagogical research and practices; training and awareness for administrators, educators, students, and parents; and coordinating with related national efforts.

Why Computer Science?

1. CS is a required 21st century literacy needed by every citizen in a digital world.
2. CS education strengthens the local economy by providing a technologically competent workforce.
3. Students develop collaboration, creativity, communication, logic, and problem-solving skills.
4. CS enhances innovation and knowledge to solve modern problems.
5. There is inequitable access in a field that is in desperate need of diversity.
6. CS is fun! CS builds interest and excitement with engaging activities for all students and teachers.

Local School System Support

All 25 Local School Systems in Maryland have received support and funding. The MCCE supports the development of sustainable and scalable plans, professional development, curriculum alignment and selection, counselor awareness, and teacher mentoring and support.

Higher Education Support

13 institutions of higher education with teacher preservice preparation programs have received support and funding from the MCCE in the form of grants, workshops, collaborative work sessions, and webinars. MCCE also facilitates collaboration nationwide and provides support for additional grant opportunities.

Statewide Support

MCCE funds the position of computer science specialist at the Maryland State Department of Education, offers an annual state summit on computer science education, provides statewide summer professional development, and hosts statewide programs to support teachers to earn certification in computer science.
By the numbers:

600+ teachers attending professional development for computer science in 2019 supported by MCCE.

13+ institutions of higher education working on grant funded projects in collaborative teams across colleges and departments of computing and education to build meaningful units into preservice programs.

25 local school systems are working on plans for every high school to provide access to computer science for all students and experience with computational thinking for every middle school student. Many have also started integrating activities, projects, and concepts into elementary schools as well.

State Requirements:

- Every high school offers a high-quality computer science class by 2021-22.
- Every middle school incorporates instruction in CS and computational thinking.
- Increase enrollment in CS courses of female students; students with disabilities; and students of ethnic, racial, and other demographics that are underrepresented in the field of CS as identified by the U.S. Equal Employment Opportunity Commission.

Funding: The Maryland Center for Computing Education was established and funded by the state through legislation with an initial investment of $5 million in 2018 followed by an additional $1 million in 2019. The funding is provided by a special, non-lapsing fund. The MCCE is charged to fund competitive grants to local school systems, work in consultation and collaboration with institutions of higher education, provide professional development and programs, maintain a clearinghouse of recommended resources, and communicate and promote activities that benefit computer science education.

Planning for Lasting Change: Since 2014, only 4 teachers have graduated in the state of Maryland who are certified to teach computer science. There are currently well over 200 teachers teaching computer science in Maryland. The short-term solution is to provide targeted, just-in-time professional development and mentoring to teachers who are from a variety of subject areas to fill the need. These teachers are provided with just enough training to teach a particular course or unit. The long-term solution requires knowledge and education across all sectors.

Research and Data: MCCE works in close association with the Maryland Longitudinal Data System Center (MLDSC) and is currently vetting and organizing existing data to make it accessible through an online public dashboard that will track student progress and engagement in computer science from PK-12 through higher education and/or workforce. The MCCE has supported school systems, higher education institutions, and other state providers of computer science education through the submission of 9 grants (3 more pending and 2 in draft) to the National Science Foundation, Department of Education, Department of Energy, as well as public and private funding institutions.

Partners and Collaborators:

Contact information for the Maryland Center for Computing Education:
The Annual Report is available on the website cs4md.com
Dianne O'Grady-Cunniff, dogrady@usmd.edu
Director, MCCE

Dr. Megean Garvin, mgarvin@usmd.edu
Director of Research, MCCE

MCCE Page 2 of 2
Bridging the Gap Between High School and College Mathematics in Maryland
Maryland Mathematics Alignment Project (MMAP)

The gap between high school and post-secondary mathematics continues to be a challenge in Maryland, just as it is across the nation. While meeting the needs of many college students, the traditional algebra to calculus mathematics pathway, required by most colleges, does not provide the mathematical skills needed for some majors and often has become a barrier to graduation for capable students. Over the last five years, curriculum reform has expanded mathematics options for college students. This reform is often referred to as mathematics pathways. Many colleges in Maryland currently offer mathematics pathways that include courses such as Statistics and Quantitative Literacy, as well as the traditional courses that lead to Calculus and beyond. These pathways courses provide a variety of general education mathematics options for college students. The Maryland Mathematics Alignment Project (MMAP) is designed to explore opportunities (and potential risks) for high school students to participate in mathematics pathways options before they enter college.

Maryland began its work on the Mathematics Pathways in 2014 through the work of the First in the World Maryland Mathematics Reform Initiative. As a result, progress has been made in the offerings of more mathematics pathways at the college level. However, Maryland is still missing a bridge between the high school mathematics coursework and the new college-level mathematics pathways. To begin to address this issue, representatives from the Maryland State Department of Education and the University System of Maryland, along with representatives from Maryland’s K-12 and IHE communities, participated in a forum (May 5-7, 2019) hosted by the Conference Board of Mathematical Sciences (CBMS) entitled “CBMS High School to College Mathematics’ Pathways: Preparing Students for the Future”.

Maryland was one of 22 states invited to participate in the forum, hosted by CBMS, in collaboration with the Charles A. Dana Center at the University of Texas, Austin, and Achieve. CBMS has eighteen members whose primary objective is advancing the mathematical sciences. The Mathematical Association of America (MAA); the American Mathematical Society (AMS); the Association of Mathematics Teacher Education (AMTE); the National Council of Supervisors of Mathematics (NCSM), and the National Council of Teachers of Mathematics (NCTM) are among CBMS members. Drawing on the Dana Center Mathematics Pathways work and the expertise of various members of the CBMS societies, the forum provided an opportunity for a dialogue among a broad array of national stakeholders. The May convening was designed to provide support to state-leadership teams who wished to create a state-based task force that would work to put policies and practices in place to reduce or eliminate gaps between high school and college mathematics.

The Forum focused on three issues:

- **Responding to the changing role of mathematics in the economy.** The avalanche of data across all fields is spurring exciting and important work in mathematics. The transition years of grades 11–14 are critical for building the foundations for a workforce that can meet the evolving needs of the new economy.

- **Ensuring college readiness today and tomorrow.** High school and college mathematics educators are working collaboratively on this issue, recognizing the need for college-ready students, but also student-ready colleges. CBMS societies acknowledge the need for a broader understanding of how mathematics is and will be used, encompassing modeling, statistics, and data science. They also understand the need for active learning approaches that promote problem solving abilities and higher order thinking.

- **Articulating the mathematical pathways that will serve all students.** Changes in demographics, economic demands, and the mathematical sciences themselves are forcing reconsideration of the pathways into and through college-level mathematics. It is necessary to evaluate whether the course structures now in place still serve their intended purpose and to understand the alternatives that are available.

Through the forum, Maryland has the opportunity to build a leadership team that will work to help Maryland bridge the gap between high school and college-level mathematics coursework. The first step in this project will be to build a Maryland Mathematics Alignment Project Task Force (MMAP Task Force). To be truly effective, the MMAP Task Force should consist of representatives of all interests across the state including business and industry, as well as those who
shape educational policy and those who implement it at both high school and post-secondary levels, both two- and four-year colleges and universities. The MMA Task Force will address curriculum standards, instructional practices, policies and regulations, professional development needs and messages.

If you would like to learn more about the Maryland Mathematics Alignment Project, please contact Debby Ward, Coordinator of Mathematics, Maryland State Department of Education (Debra.ward@maryland.gov).

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TOPIC: Update on the USM New Student Enrollment Pipeline and Aggregate Student Success; USM-Wide Student Success Initiatives

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 6, 2020

SUMMARY: The report included is an information item that provides aggregate data about the student success achieved by new students entering the enrollment pipeline at University System of Maryland (USM) institutions. Information in the report includes the overall size and source of new student cohorts entering the USM pipeline between FY 2011 and FY 2019, aggregated retention rates for USM institutions, aggregated graduation rates, and progress toward eliminating achievement gaps. Data about the size and make-up of the new student pipeline is useful for understanding student success and campus initiatives for increasing student success.

In addition to this report, a presentation summarizing the student success outcomes and an update about system-level and campus initiatives will be given to the committee.

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR’S RECOMMENDATION: This is an information item.

COMMITTEE RECOMMENDATION: Information Only

BOARD ACTION: Information Only

SUBMITTED BY: Ellen Herbst 301-445-1923 eherbst@usmd.edu
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UPDATE ON THE USM NEW STUDENT ENROLLMENT PIPELINE AND AGGREGATE STUDENT SUCCESS

Office of Institutional Research
Vice Chancellor for Administration and Finance
University System of Maryland Office
March 2020
This information item provides an update on the level of success achieved by new students entering the enrollment pipeline at University System of Maryland (USM) institutions. Information provided in the item includes the overall size and source of new student cohorts entering the USM pipeline between FY 2011 and FY 2019, aggregated retention rates for USM institutions, aggregated graduation rates, and progress toward eliminating achievement gaps. For additional information, please contact Chad Muntz, Assistant Vice Chancellor for Institutional Research, Data & Analytics at the USM at cmuntz@usmd.edu (301-445-2737).

New Student Enrollment Pipeline

To understand the level of success achieved by new students entering the USM enrollment pipeline, it is first helpful to understand the overall volume of new students enrolling at USM institutions, as well as where those new students are coming from. The number of new degree-seeking students entering a USM institution at any point during the fiscal year ranged from 32,000 in FY 2011 to over 43,000 in FY 2019. Importantly, these fiscal year cohorts include both new first-time students and new transfers. Like most university systems, the USM has experienced a change in the mix of new students comprising these cohorts as more non-traditional adult students have begun to pursue higher education, and the volume of high school graduates has decreased. Understanding this mix is important, in turn, for understanding student success as measured through retention and graduation rates.

Approximately two-thirds of all new students entering a USM institution between FY 2011 and FY 2019 came from one of two groups: First-time Students (whether First-time, Full-time or First-time Other, signifying anyone not full-time) who comprised approximately one-third of the total new student enrollment between FY 11 and FY 19, and New Maryland Community College (MDCC) Transfers, who comprised another third. The primary well-spring for both groups of new students -- First-time Student and New MDCC Transfers -- remained the Maryland high school graduate pipeline.

In addition, a third of all new students entering the USM enrollment pipeline between FY 2011 and FY 2019 came from less established, but rapidly growing, pipelines. These students, who are classified in this report as “New Transfer Other,” include some students who swirled between Maryland 4-year institutions, but the majority of this group transferred to USM institutions from a four-year or two-year institution outside the state of Maryland. The majority of these students transferred in with credit and were often students who were older, working adults. USM’s agile, distance education institution, the University of Maryland Global Campus (UMGC), enrolled most of the “New Transfer Other” students. A breakdown of the enrollment pipeline by these groups is presented below in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Fiscal Year New Degree-Seeking Cohort</th>
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<tbody>
<tr>
<td>-------</td>
</tr>
<tr>
<td>First-time, Full-time</td>
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<tr>
<td>First-time Other</td>
</tr>
<tr>
<td>New Transfer MDCC</td>
</tr>
<tr>
<td>New Transfer Other</td>
</tr>
<tr>
<td>Total</td>
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Undergraduate Pipeline 1
Retention Rates

The fall retention rate of New, Degree-Seeking Students decreased from a high of 76% for the FY 2011 cohort to just under 70% (69.5%) for the most recent (FY 2019) cohort. The decrease in retention was attributable to the growth in the number of “New Transfer Other” students discussed above. Because these students stop-out and/or transfer between multiple institutions, they historically have lower retention rates overall, which impacts the USM average. The highest retention rates were achieved by First-time, Full-time students and Maryland Community College Transfers. See Table 2 below for additional information.

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</thead>
<tbody>
<tr>
<td>First-time, Full-time</td>
<td>84.6%</td>
<td>84.7%</td>
<td>85.0%</td>
<td>86.4%</td>
<td>85.2%</td>
<td>85.0%</td>
<td>85.2%</td>
<td>85.7%</td>
<td>86.4%</td>
</tr>
<tr>
<td>First-time Other</td>
<td>43%</td>
<td>21.0%</td>
<td>18.8%</td>
<td>21.0%</td>
<td>28.6%</td>
<td>31.3%</td>
<td>35.1%</td>
<td>36.7%</td>
<td>34.6%</td>
</tr>
<tr>
<td>New Transfer MDCC</td>
<td>81%</td>
<td>78.9%</td>
<td>79.0%</td>
<td>79.3%</td>
<td>79.2%</td>
<td>80.2%</td>
<td>80.3%</td>
<td>79.4%</td>
<td>77.6%</td>
</tr>
<tr>
<td>New Transfer Other</td>
<td>63%</td>
<td>58.4%</td>
<td>56.5%</td>
<td>58.9%</td>
<td>59.6%</td>
<td>56.7%</td>
<td>54.8%</td>
<td>53.7%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Total</td>
<td>76.4%</td>
<td>73.6%</td>
<td>73.3%</td>
<td>74.2%</td>
<td>73.5%</td>
<td>72.1%</td>
<td>72.0%</td>
<td>71.1%</td>
<td>69.5%</td>
</tr>
</tbody>
</table>

Graduation Rates within 6-years of Entry

Over the last four fiscal years the six-year graduation rate for New, Degree-Seeking Students has improved from 57% graduating within six years of entry (for the cohort that entered in FY 2011) to 61% (for the cohort that entered in FY 2014). Importantly, this increase came while the overall number of new students also increased. Because the USM increased its rate of student success at the same time it increased the number of students enrolled, the overall number of degrees awarded each year also increased (see Table 4).

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<tbody>
<tr>
<td>Cohort</td>
<td>32,610</td>
<td>34,456</td>
<td>35,076</td>
<td>36,644</td>
<td></td>
<td></td>
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<tr>
<td>Graduated</td>
<td>57%</td>
<td>56%</td>
<td>57%</td>
<td>61%</td>
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Table 4. Baccalaureate Degrees Granted

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<tr>
<td></td>
<td>21,227</td>
<td>22,585</td>
<td>23,238</td>
<td>23,724</td>
<td>25,048</td>
<td>25,776</td>
<td>26,280</td>
<td>26,657</td>
<td>27,039</td>
</tr>
</tbody>
</table>

Undergraduate Pipeline 2
As with retention, the different types of new students entering the USM enrollment pipeline impacts the aggregate graduation rate for the USM. First-Time, Full-Time Students and MDCC Transfer Students had the highest graduation rates compared to the “New Transfer Other” students. However, rates improved significantly for students who began and enrolled full-time. Table 5 below provides the number and six-year graduation rate broken down by group for the most recent (FY 2014) cohort.

Table 5. FY 2014 Degree-Seeking Cohort
Graduation Within Six Years

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td>Total</td>
<td>36,644</td>
<td>61%</td>
</tr>
<tr>
<td>First-time, Full-time</td>
<td>14,058</td>
<td>73%</td>
</tr>
<tr>
<td>First-time Other</td>
<td>1,459</td>
<td>5%</td>
</tr>
<tr>
<td>New Transfer MDCC</td>
<td>11,071</td>
<td>68%</td>
</tr>
<tr>
<td>MDCC Full-time Only</td>
<td>7,546</td>
<td>76%</td>
</tr>
<tr>
<td>New Transfer Other</td>
<td>10,056</td>
<td>44%</td>
</tr>
<tr>
<td>Other Full-time Only</td>
<td>4,423</td>
<td>66%</td>
</tr>
</tbody>
</table>

**Closing Achievement Gaps**

Beginning in 2008, the USM launched an initiative with an ambitious goal of closing existing achievement gaps between students by 2020. While USM Institutions have improved outcomes for lower-income and minority students since 2008, achievement gaps have remained for all types of new students. Once the academic preparation, transfer credit, and attendance status were held constant, however, data show that the graduation gaps have narrowed. Although this report was not designed to provide a detailed update on campus progress toward closing achievement gaps, Table 6 below summarizes, based on the most recent fiscal year data (FY 2014), the graduation gap for underrepresented minority students compared to the total student cohort for USM as a whole. Continued progress toward closing achievement gaps would further improve overall USM student success rates, increase enrollment, and increase the baccalaureate degrees conferred for Maryland’s workforce.

Table 6. FY 2014 Degree-Seeking Cohort
Underrepresented Minority (URM) Graduation Within Six Years

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>URM Grad %</th>
<th>URM Gap %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>12,395</td>
<td>50%</td>
<td>-11%</td>
</tr>
<tr>
<td>First-time, Full-time</td>
<td>4,169</td>
<td>60%</td>
<td>-13%</td>
</tr>
<tr>
<td>First-time Other</td>
<td>766</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>New Transfer MDCC</td>
<td>3,622</td>
<td>61%</td>
<td>-7%</td>
</tr>
<tr>
<td>MDCC Full-time Only</td>
<td>2,288</td>
<td>70%</td>
<td>-6%</td>
</tr>
<tr>
<td>New Transfer Other</td>
<td>3,847</td>
<td>37%</td>
<td>-7%</td>
</tr>
<tr>
<td>Other Full-time Only</td>
<td>1,610</td>
<td>58%</td>
<td>-8%</td>
</tr>
</tbody>
</table>
Conclusion

The USM’s most recent analysis of the new student pipeline and student success measures shows that USM institutions have increased new student enrollment and increased student success. This success has come despite an increased mix in the sources of, and types of, new students enrolling at USM institutions. That mix, in combination with the attendance status of these students, ultimately influences retention and graduation rates. The data in this report suggest that USM institutions will be pressed to achieve similar results in the future without 1) continued efforts to improve student success among part-time, non-traditional students, 2) further narrowing of achievement gaps, and 3) engaging in more outreach to former students and near completers. The pipeline of future high school graduates will continue to decrease nationwide. This has the potential to negatively impact future new student enrollment and the number of new transfers coming from community colleges. In summary, to sustain enrollment and provide the graduates that Maryland’s workforce needs, the USM and its institutions must continue to improve on the already high-level of student success they have achieved.
TOPIC: Crisis Management and Enterprise Risk Management in the USM

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 6, 2020

SUMMARY: At the November 2018 Board of Regents retreat, the Board agreed that USM needed to develop a policy that would guide the Chancellor and Presidents in their implementation of enterprise risk management (ERM) and crisis management (CM) processes. Reporting to the Audit Committee of the Board, Regent Louis Pope chaired a workgroup whose objective was to fully understand ERM and CM and the needs of our System and institutions. It was shown that best practice in effective governance, at both an institution and System-wide level, requires that management have a process for responding to events considered to be a crisis and that management periodically assesses potential risks and exposures, evaluates the probability and the impact of each, and, where appropriate, adopts risk mitigation strategies.

On November 22, 2019, the Board of Regents passed the USM Policy on Enterprise Risk Management (VIII-20.00), which formalizes the expectation that each institution, regional higher education center, and the System Office develop processes to periodically identify, review, and assess significant strategic, financial, operational, and reputational risks. Also, on November 22, 2019, the Board passed the USM Policy on Crisis Management (VIII-21.00), which formalizes the expectation that each institution, regional higher education center, and the System Office develop processes and protocols for responding to negative unanticipated events and ensure organization-wide understanding of the response protocol. Furthermore, each entity shall adopt risk prevention and mitigation strategies, and periodically discuss those risks and the prevention or mitigation strategies with the Chancellor as a part of the annual presidential performance evaluation process. Institution presidents have until Spring 2020 to establish a crisis management process and will begin the required reporting under this policy during the performance appraisal process in the Spring of 2021. Additionally, starting in Spring 2021, institution presidents will have to report institutional risks and mitigation or prevention strategies during their performance appraisal process.

The committee will hear about these policies and their importance and significance to USM and our institutions.

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR’S RECOMMENDATION: This is an information item.

COMMITTEE RECOMMENDATION: Information Only DATE: March 6, 2020

BOARD ACTION: DATE:

SUBMITTED BY: Ellen Herbst 301-445-1923 eherbst@usmd.edu
VIII-20.00 POLICY ON ENTERPRISE RISK MANAGEMENT
(Approved by the Board of Regents on November 22, 2019)

I. PURPOSE

Best practices in effective governance at an institution and System-wide level, requires that management periodically assesses potential risks and exposures, evaluates the probability and the impact of each and where appropriate, adopts risk mitigation strategies. These processes should inform decisions and strategic planning, both within each institution, as well as at the System level.

This policy formalizes expectations of each University System of Maryland institution to establish an ongoing system of risk management appropriate to the institution’s mission and strategic initiatives. The policy also sets periodic reporting expectations and processes for reporting key risk items.

II. ENTERPRISE RISK MANAGEMENT (ERM)

A. Institution-level ERM

Pursuant to this policy, each USM institution and regional higher education center, including the USM Office, is to adopt an enterprise risk management process. The process should be developed to assure that potentially significant and likely risk exposures have been identified and communicated to institutional leadership, and that plans to reduce the risk of occurrence, or mitigate the exposure have been developed.

Under the leadership of each institution’s President, an institution-wide body, such as a campus cabinet or president’s leadership team, is to identify and quantify risks, determine risk tolerances, and oversee risk mitigation strategies or measures where appropriate.

The enterprise risk management process must include an inventory, or register, of risks and exposures that are potentially significant in terms of both likelihood and impact that strategic interests and goals of the institution could be impacted. Each risk should have identified a responsible official or department which will monitor and adopt mitigation strategies as appropriate, and periodically report to the institution-wide body responsible for overseeing the risk management process. Risks are to be evaluated as to the potential impact, as well as the likelihood of occurrence.

Institutions are expected to adopt risk management practices suitable and appropriate to the institution’s activities and goals. Tailoring risk management activities to the institution’s focus and goals may result in similar institutions assessing the likelihood, and the impact, of similarly described risks differently, with risk tolerance and mitigation
strategies that reflect those differences. Each risk management process is to include the basic steps of:

- Risk identification;
- Risk assessment;
- Risk tolerance, prevention and mitigation; and
- Reporting,

the specific risks, determination as to impact and likelihood, and accordingly, prevention and mitigation strategies, are likely to vary from institution to institution. It is important that each cycle of assessment and evaluation of risks, impact and likelihood, also consider the identification of new and emerging risks.

This policy is not intended to require a specific risk identification, assessment, mitigation or reporting process and acknowledges that institution’s may have different approaches and processes to address enterprise risk management.

B. System-wide

The Chancellor is to develop a risk management process for the University System of Maryland appropriate for a comprehensive state-wide university system, that identifies, assesses, mitigates and communicates System-wide risks and exposures, and complements risk management practices at each institution. The risk assessment is to be done in consultation with the Director of Internal Audit, vice chancellors, and institution presidents, and should represent a set of identified System-wide risks and exposures appropriate to System-wide planning and action.

A review and discussion of System-wide risks and exposures, the assessment of impact and likelihood, and strategies and efforts in place to address, prevent or mitigate System-wide risks is to be considered by the Board of Regents Committee on Audits at least annually.

III. REPORTING REQUIREMENTS

Institution Presidents are expected to communicate to the Chancellor that an institutional enterprise risk management process is in place and operationally functional, and review with the Chancellor, as a part of the presidential performance review process, the 3-5 risks assessed to be the most significant concerns to institutional leadership in terms of setting strategic goals and planning.

Institution Presidents, by March 31st annually, are to provide notification to the Chancellor that a review or update of the institution’s risk assessment and management plan has been performed, and are to provide a listing of significant events that have occurred in the prior calendar year that were contemplated and planned for in the institution’s risk management process.
IV. DEFINITIONS

Strategic risks – an event or activity, whether internal or external, that has the potential to negatively impact the institution’s ability to pursue its mission and/or achieve its key strategic goals and objectives. These risks include inadequate strategic planning and goal setting, crisis response and business continuity, reputation and brand, and community relations.

Financial risks – risks and exposures that are associated with inadequate financial planning, management and operational outcomes, including the budgeting and financial reporting processes, financial controls, debt management, endowment investing, and risk management and insurance provision.

Operational risks – risks and exposures that do not have an immediate financial impact but impact the core mission and objectives of the institution. Included here are risks to the academic enterprise such as academic quality, tenure and faculty promotion, accreditation, faculty recruitment, on-line learning, program development (including closures, new programs, and international programs). Weather events, power disruptions, and other potential events impacting availability of facilities, would be another group of operational risks, to the extent that those risks are both likely and significant in impact. Research activities and issues surrounding medical centers would also fall under the category of operational risks.

Reputational risks - risks and exposures that may harm education mission by casting doubt on commitments by campus leadership and negatively affecting the image of the University. Such risks may include claims of harassment and discrimination, waste and abuse, scholarly misconduct. Reputational risks may also be strategic, financial and operational risks depending on the nature and severity.

Risk mitigation - steps taken at the institution and System level to identify, assess and address and report on potential risks. Risk mitigation may include institution level threat and risk assessment team efforts, trainings, coordinated efforts across institutions to identify and mitigate risk.

Risk tolerance – ability or willingness by an institution or the System’s leadership to accept a certain level of likelihood that a particular risk exposure materializes. Risk tolerance is important in considering the possibilities for mitigating or eliminating particular risks and exposures, each of which are likely to carry an associated cost or set of requirements.
VIII-21.00 POLICY ON CRISIS MANAGEMENT
(Approved by the Board of Regents on November 22, 2019)

I. PURPOSE

Best practice in effective governance at both an institution and System-wide level, requires that management have a process for responding to events considered to be a crisis.

This policy formalizes expectations that each University System of Maryland institution and regional higher education center, including the System Office, and the chancellor on behalf of the University System generally, establish a process and set of protocols and steps for use in responding to events that each level considers a crisis, as defined below.

II. CRISIS MANAGEMENT

Each President shall develop protocols for use in responding to and communicating when a crisis arises. Board of Regents Policy VI-10.00 formalizes requirements associated with campus emergency planning, preparedness, and response. An emergency, depending on the impact and exposure, operationally, in terms of public safety, and reputationally, may also be considered a crisis within the meaning of this policy and require additional coordination and consultation, public communication, and response and recovery.

A crisis is defined as:

1. A negative event that was unanticipated and for which plans had not been formulated,
2. A negative event that had been planned for, but happened at a rate or pace unanticipated, or
3. A confluence of events anticipated and planned for individually, but not in combination.

The University System Office will provide guidance to support each President developing a crisis management process for their university appropriate for that university, that, at minimum, includes clear reporting and escalation, response structure and team roles, and crisis communications.

Each institution, and the System as a whole, are to develop crisis communication plans that detail who is responsible for communications in the event of particular events, and a general plan for events not anticipated.

Care should be taken to ensure that crisis communications considers and includes students, faculty, staff, and other identified institution and System interested parties. Once a crisis management process has been developed by an institution, periodic testing of the process in response to a potential crisis should be carried out to ensure that all involved at an institution in
crisis management understand roles, protocols, and processes. The process should be reviewed and refined after any actual crisis event, if appropriate, to improve institutional responses and communications.

In the event of a crisis, immediate notification to the Chancellor and the Vice Chancellor for Communications is to happen as soon as is practical under the circumstances, even if all the facts and considerations are not yet known. The Chancellor will communicate with the Chair of the Board of Regents to provide an understanding of the event or emergency, the current institution or System response, and to consult on the communication strategy as appropriate.

III. REPORTING REQUIREMENTS

Institution Presidents are expected to communicate to the Chancellor that an institution level crisis management process has been established and is understood, and reviewed with the Chancellor, as a part of the presidential performance review process, any negative events and emergencies at the institution level that fall within the definition of crisis above that occurred in the prior calendar year.