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1525 Greenspring Valley Road
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13 November 2018

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

Dear Secretary Fielder:

Thank you for the opportunity to respond to the objection letter submitted by the University of Maryland Baltimore County (UMBC) regarding Stevenson University's proposal for a new Bachelor of Science degree in Biomedical Engineering. With this letter, we respond to the concerns raised by UMBC in their letter and to the directive issued by MHEC's Education Policy Analyst in her letter to pay particular attention to COMAR 13B.02.03.09 concerning duplication of the proposed program.

First, we note that UMBC has not raised a valid objection under Maryland law. Specifically, their concerns do not identify any of the four specific reasons for objection permitted in COMAR 13B.02.03.27. UMBC's claim that "Creation of the Stevenson University program will draw students away from our program and thus will be detrimental to UMBC's program" falls far short of the COMAR criterion on "unreasonable duplication" which requires the proposed program to "**cause demonstrable harm to another institution.**"

UMBC's objection is not "accompanied by detailed data and information supporting the reasons for the objection" as required by the cited regulations. Moreover, we will present specific data below demonstrating that UMBC's claim that the proposed program will "draw students away from our program" is false.

Second, and in response to the request of MHEC's Education Policy Analyst to comment on COMAR 13B.02.03.09 "concerning duplication of the proposed program," we note that UMBC does not offer the proposed degree in Biomedical Engineering or any distinct degree in bioengineering. While UMBC does offer a Bachelor of Science degree in Chemical Engineering, and the Biotechnology and Bioengineering track is one of three tracks within the degree program, this "track" is not a State-approved Area of Concentration, it is not recognized by MHEC and is not listed in MHEC's Academic Program Inventory. For these reasons, UMBC's program was not included in our original analysis.

To respond further to the Education Policy Analyst's request to comment on program duplication, we examined the specific academic content of our proposed degree and UMBC's track in Chemical Engineering. For completeness, a revised Table 2 lists this track with the existing programs. Academic overlap between the proposed program and UMBC's program is minimal. While UMBC's response indicates its Chemical Engineering track "includes several classes related to biomedical engineering," Stevenson's proposed program includes 49 credits of coursework (13 courses) specifically in biomedical engineering. Further, and in contrast to the [program outcomes](#) for UMBC's Chemical Engineering program, which highlight proficiency in and the application of chemical engineering principles, Stevenson's proposed program outcomes (on p. 9 of the original proposal) focus explicitly on the application of engineering skills and technology to living systems and the solution of biomedical problems.

A second perspective on program duplication arises from consideration of "market demand for the program." As indicated in COMAR 13B.02.03.09, factors like "enrollment characteristics" and "admissions requirements" are germane to the analysis of market demand and program duplication. Limited overlap in the profiles of enrolled students indicate programs are not duplicative.

Differences in the academic profiles of Stevenson and UMBC's enrolled students and the size of the two campus environments (3,000 vs 14,000 students) suggest there will be limited overlap in market demand. For example, students who apply to Stevenson are generally interested in enrolling at a smaller institution. Analysis of cross-application data provided by the National Center on Education Clearinghouse strongly supports this view. We examined the number of students in the most-recently available data who enrolled in two science programs at Stevenson (Chemistry and Biochemistry) to see how many of these students also applied to UMBC. We chose these two academic programs because they share some overlap with the proposed program in the abilities needed to succeed academically. Only 1 of the 21 students who enrolled in Chemistry at Stevenson applied to UMBC and only 3 of the 19 students who enrolled in Biochemistry at Stevenson applied to UMBC. These results demonstrate limited overlap in the profiles of enrolled students and argue strongly against UMBC's claim of program duplication.

They also provide evidence against UMBC's claim that "Creation of the Stevenson University program will draw students away from our program and thus will be detrimental to UMBC's program". Similarly, there is no evidence that our proposed program will "cause demonstrable harm" to UMBC as required by the program duplication standards. The evidence indicates that the students who will enroll in Stevenson's program will not generally apply to UMBC and that the proposed program will not cause any harm to UMBC. Instead, the addition of the proposed program will create pathways for students who would not otherwise have the opportunity to study engineering as envisioned in the [Maryland State Plan for Postsecondary Education](#).

We also wish to comment briefly on a number of additional assertions. Based on the omission of the Biotechnology and Bioengineering track of UMBC's Bachelor of Science degree in

Chemical Engineering from our initial analysis, UMBC claims that “the data and projections regarding demand and capacity for this new program are incorrect and ignore the potential impact of the proposed program on UMBC.”

The information cited above regarding cross-applications examines this issue from the perspective of student demand for programs. It demonstrates that student demand for UMBC and Stevenson programs does not generally overlap in fields similar to the proposed program. Moreover, the College Board reported that 11% of the Class of 2017 in the State of Maryland indicated engineering as their first choice major. While these data are not broken into specific fields of engineering, the interest of over 4,000 students in Maryland in engineering, coupled with the limited size of Stevenson’s proposed program (i.e., 10-20 students per year at maximum size) and the limited overlap of Stevenson’s enrollments with UMBC’s applications (e.g., 1-2 applications), reinforces that there will be little or no impact of the proposed program on UMBC’s enrollments.

We also examined UMBC’s assertion from the perspective of employer demand for employees. While it is unreasonable to assume all 58 of the UMBC graduates who received a B.S. in Chemical Engineering in 2016-2017 ([IPEDS 2016-2017 Final Release Data](#)) were in UMBC’s Biotechnology and Bioengineering track, these 58 graduates combined with graduates of the University of Maryland College Park and Johns Hopkins University in these fields total 280 graduates. This is far below the projected demand for employees of 699 in the bioengineering field. Thus, there remain significant employment opportunities for additional graduates and significant employer demand even if every UMBC Chemical Engineering graduate is included in our analysis. We have revised *Table 3. Number of Graduates in Biomedical Engineering* (attached) to incorporate these changes.

Last, UMBC makes a number of assertions about Stevenson’s prospective faculty and accreditation. Given that these assertions are not directly related to the regulations on proposed programs, we will not address them in detail here. UMBC’s assertions are inaccurate. We discuss these issues in the attached Appendix A and are glad to discuss them further at your request.

In summary:

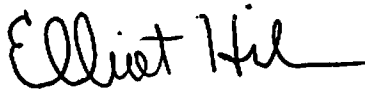
- 1) UMBC has not raised a valid objection to the proposed program under Maryland law, nor have they provided detailed data and information to support their claims as required by law.
- 2) Regarding the specific question of program duplication, UMBC does not offer the proposed degree. Further, there are significant academic differences between the proposed degree and UMBC’s extant degrees and analysis of cross application and market demand data indicates limited market overlap and no evidence for the prospect of demonstrable harm to UMBC.

- 3) Incorporating additional information regarding the graduates of UMBC's Chemical Engineering B.S. program into our analyses does not alter our conclusions regarding available student or employer demand.

Stevenson University's proposed Bachelor of Science degree in Biomedical Engineering is not unreasonably duplicative, is not likely to cause demonstrable harm to UMBC, is well-aligned with Stevenson's mission, responds to a documented need for STEM graduates trained in biomedical engineering, and will meet a regional and statewide need for "tech talent" consistent with the *Maryland State Plan for Postsecondary Education*.

Thank you again for the opportunity to address the concerns raised by UMBC. Please do not hesitate to contact me if I can provide additional information to MHEC in support of Stevenson University's Bachelor of Science in Biomedical Engineering.

Sincerely,



Elliot Hirshman, Ph.D.
President

cc: Dr. Susan Gorman, EVP Academic Affairs and Provost
Ms. Tina Bjarekull, President of MICUA

APPENDIX A

Though UMBC's discussion of Stevenson's faculty qualifications and prospects for accreditation is not relevant to questions of program duplication under Maryland law, we would like to provide additional information in response to the observations in UMBC's letter.

UMBC correctly notes that the faculty listed in Table 6 (p. 21) of the original proposal are scientists and mathematicians. The text preceding this table explicitly states that these faculty will teach the science and mathematics courses that are integral to the proposed program. The proposal also clearly indicates (on pages 9, 21, and 27) that full- and part-time faculty with appropriate credentials and experience in engineering will be hired as enrollment warrants, starting with the 10-month Program Coordinator. The Accrediting Board for Engineering and Technology (ABET) states that program faculty must be "sufficient in number and ... have the competencies to cover all areas of the program" as well as possess "appropriate qualifications." ABET's [criterion for faculty](#) does not specify particular numbers of faculty or whether they must be full- or part-time. Thus, Stevenson University's plan to hire additional appropriately credentialed full- and part-time faculty as enrollment warrants is reasonable and fiscally responsible.

In relation to the discussion of the proposed program's prospects for accreditation, we note that the proposal specifically addresses the ABET criteria regarding curriculum on p. 19 of the proposal. The proposed curriculum was developed based on consultation with a former reviewer for ABET and it meets the criteria for curriculum as listed in the 2018-2019 ABET Engineering Accreditation Commission's [accreditation manual](#), including a minimum of one year (32 credits) of science and mathematics, one and a half years (48 credits) of engineering, and a general education curriculum that complements the technical components and is consistent with program and institutional objectives. In fact, the proposed curriculum includes 49 credits of engineering coursework (which includes a required internship and a capstone internship or research experience), 42 credits of science and mathematics, and the general education curriculum required by the University. Stevenson's proposed curriculum will meet ABET accreditation standards and will effectively prepare our graduates for entry into this highly interdisciplinary field.

Table 2. Biomedical Engineering and Related Degree Programs in Maryland (Revised)

Program Name	Degree(s) Offered	Institution
CIP Code 140301 (Agricultural/Biological Engineering and Bioengineering)		
Bioengineering	Bachelor's	University of Maryland College Park
Biological Resources Engineering	Master's	University of Maryland College Park
CIP Code 140501 Biomedical/Medical Engineering		
Bioengineering	Bachelor's/Doctorate	University of Maryland College Park
Biomedical Engineering	Bachelor's/Master's/Doctorate	Johns Hopkins University
Applied Biomedical Engineering	Master's/Post-Master's Certificate	Johns Hopkins University
Bioengineering Innovation & Design	Master's	Johns Hopkins University
CIP Code 140701 Chemical Engineering		
Chemical & Biomolecular Engineering	Bachelor's/Master's/Doctorate	Johns Hopkins University
Chemical & Biochemical Engineering	Master's/Doctorate	University of Maryland Baltimore County
Chemical Engineering: "Track" in Biotechnology and Bioengineering*	Bachelor's	University of Maryland Baltimore County

* MHEC does not approve tracks within degree programs, nor does MHEC include tracks in the Academic Program Inventory (API). Per COMAR [13b.02.03.02](#), only "Areas of Concentration" are approved by MHEC and included in the State's API.

Table 3. Number of Graduates in Biomedical Engineering (Revised)

Institution	Number of Graduates (2015-2016)	Number of Graduates (2016-2017)	Estimated Employment Openings (2016)	Projected Employment Openings (2026)
Johns Hopkins University	123	103	668	699
Univ. of Maryland College Park	104	94		
UMBC	53	58		
TOTAL	280	255		