

July 10, 2019



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

Dear Secretary Fielder:

McDaniel College is submitting New Program Proposals for eight undergraduate Bachelor of Arts programs. All programs were approved by the McDaniel College faculty during the spring semester and the Board of Trustees at their May meeting.

The programs are as follows:

- Actuarial Science
- Applied Mathematics
- Biochemistry
- Biomedical
- Criminal Justice
- Health Sciences
- Marketing
- Writing and Publishing

The complete proposals have been sent under separate cover in addition to the checks for each program proposal.

Thank you for your consideration and we look forward to hearing from you.

Sincerely,

Julia Jasken, Ph.D.
Executive Vice President/Provost



Cover Sheet for In-State Institutions
New Program or Substantial Modification to Existing Program

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

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

Payment <input checked="" type="radio"/> Yes	Payment <input type="radio"/> R*STARS	Payment <input type="radio"/> \$850.00	Date <input type="radio"/> 8/13/2019
Submitted: <input type="radio"/> No	Type: <input checked="" type="radio"/> Check	Amount:	Submitted:

Department Proposing Program	Chemistry		
Degree Level and Degree Type	Undergraduate, Bachelor of Arts		
Title of Proposed Program	Biochemistry		
Total Number of Credits	128		
Suggested Codes	HEGIS:	CIP: 26.0202	
Program Modality	<input checked="" type="radio"/> On-campus <input type="radio"/> Distance Education (<i>fully online</i>) <input type="radio"/> Both		
Program Resources	<input checked="" type="radio"/> Using Existing Resources <input type="radio"/> Requiring New Resources		
Projected Implementation Date	<input checked="" type="radio"/> Fall <input type="radio"/> Spring <input type="radio"/> Summer Year: 2019		
Provide Link to Most Recent Academic Catalog	URL: http://catalog.mcdaniel.edu		
Preferred Contact for this Proposal	Name:	Wendy Morris	
	Title:	Dean of the Faculty	
	Phone:	(410) 857-2521	
	Email:	wmorris@mcdaniel.edu	
President/Chief Executive	Type Name:	Roger Casey	
	Signature:		Date: 08/20/2019
	Date of Approval/Endorsement by Governing Board:	05/11/2019	

Revised 12/2018

Biochemistry - MHEC proposal

NEW ACADEMIC DEGREE PROGRAMS, NEW STAND-ALONE CERTIFICATE PROGRAMS, AND SUBSTANTIAL MODIFICATIONS

A. Centrality to Institutional Mission and Planning Priorities:

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

Institutional Mission

McDaniel College is a diverse student-centered community committed to excellence in the liberal arts and sciences and professional studies. With careful mentoring and attention to the individual, McDaniel changes lives. We challenge students to develop their unique potentials with reason, imagination, and human concern. Through flexible academic programs, collaborative and experiential learning, and global engagement, McDaniel prepares students for successful lives of leadership, service, and social responsibility.

Supporting McDaniel's commitment to *excellence in the sciences and professional studies*, the Biochemistry major proposed in this document is an interdisciplinary major that will encompass many of the core classes required for students entering graduate school in Biochemistry or those entering the Biochemical workforce. Because of the increasing internal and external interest in the field of Biochemistry, we offer this proposed major to replace our current Biochemistry specialization track within our existing Chemistry major. In addition, this major offers an *experiential learning* component in line with McDaniel's Mission. This experiential learning requirement will allow the students to obtain the knowledge necessary to gain admission to graduate programs and succeed in the biochemical workforce.

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

Strategic Vision

Sustained by the transformative power of the liberal arts, we will enhance McDaniel's reputation and strengthen our resources by increasing our focus on the unique potentials of individuals. We will challenge all students academically in a supportive environment of genuine care and graduate an increasing number of diverse, successful, and engaged alumni.

Our Goal of Excellence with Genuine Care: *We will attract, retain, and graduate more students by providing a challenging education that develops students' abilities and ambitions, ignites their passions, and prepares them for successful twenty-first century careers.*

It is our intention that the proposed will ignite students' passions as they prepare for successful 21st century careers while receiving a liberal arts education. Furthermore, the major fulfills the commitment that all undergraduate candidates *will complete one experiential learning opportunity* via an internship or research experience prior to graduation. National trends clearly demonstrate an increase in interest in Biochemistry; Using IPEDS data, Ruffalo Noel Levitz, an enrollment consulting firm, calculated the change over the last 5 years in the total number of bachelor degrees awarded and the percentage change in the most recent year. They then filtered all programs and identified any which grew faster than both the overall 5-year and 1-year percentages, thereby identifying programs that are growing faster than the total population of people earning bachelor degrees. Biochemistry was in the top twenty programs

for growth in this analysis, with an upward trend of +28% over the past 5 years. Consequently, we have noticed that many of the trends that would be predicted from this data have occurred in the McDaniel Chemistry department over this time period. Currently, many of our students are Chemistry majors with a Biochemistry specialization. This specialization will be replaced by a Biochemistry major and the following additions will be made to strengthen the major:

- 1) Addition of Molecular Biology to the major. Molecular biology is a subdiscipline of biology that studies the molecular basis for biological activity and it is a natural extension and complement to the concepts learned in Biochemistry.
- 2) Refocusing three of our traditional chemistry courses, Inorganic Chemistry, Analytical Chemistry and Physical Chemistry, to focus on bioinorganic chemistry, bioanalytical chemistry, and physical chemistry for the Health Sciences. These course revisions will be of interest/more relevant to students who wish to major in biochemistry.
- 3) Incorporation of a *laboratory research experience* as a requirement for the major. As mentioned above, the completion of at least one experiential learning opportunity will make our students more competitive for future employers or for graduate school. With the College's strategic goal to provide each student with genuine care and mentoring, we feel that providing mentored independent lab research experience in the major aligns with that goal.

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

The strategic enrollment plan (SEP) for this program involved careful collaboration with our VP of Admissions, the Provost, and faculty members who will teach in this major. Based on discussions with these faculty, the VP of Admissions worked with the Provost to determine the investments needed. This major was developed assuming that the program could continue to be sustained through existing institutional resources, but with plans for increased investments needed with the assumption of program growth (described in Section L, Table 2). Assuming the projected enrollment growth materializes, the institution is committed to hiring an additional full-time faculty member for each additional 15 students who enroll in this major and increasing the departmental budget proportionately as enrollment increases.

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

a) ongoing administrative, financial, and technical support of the proposed program

The institution is committed to supporting the needs of this new program fully and can launch the program immediately using already existing institutional resources. Administrative support will be provided by the administrative assistant for the Chemistry Department. Should enrollment in the program increase to the point of requiring additional resources, our Strategic Enrollment Plan (SEP) describes our plans and timeline for supporting increasing needs for infrastructure and new faculty (see Section L, Table 2). Any technical needs described in the SEP (physical infrastructure, hardware, or software) will be incorporated into our annual budgeting process.

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

Given the demand for this program (as described below in section C), the institution is committed to offering this program for the foreseeable future. However, should there

come a time when the institution decides to inactive this program, a multi-year plan would be developed to continue offering the required courses to any enrolled students such that they would be guaranteed to graduate with their intended major.

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

1. Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:

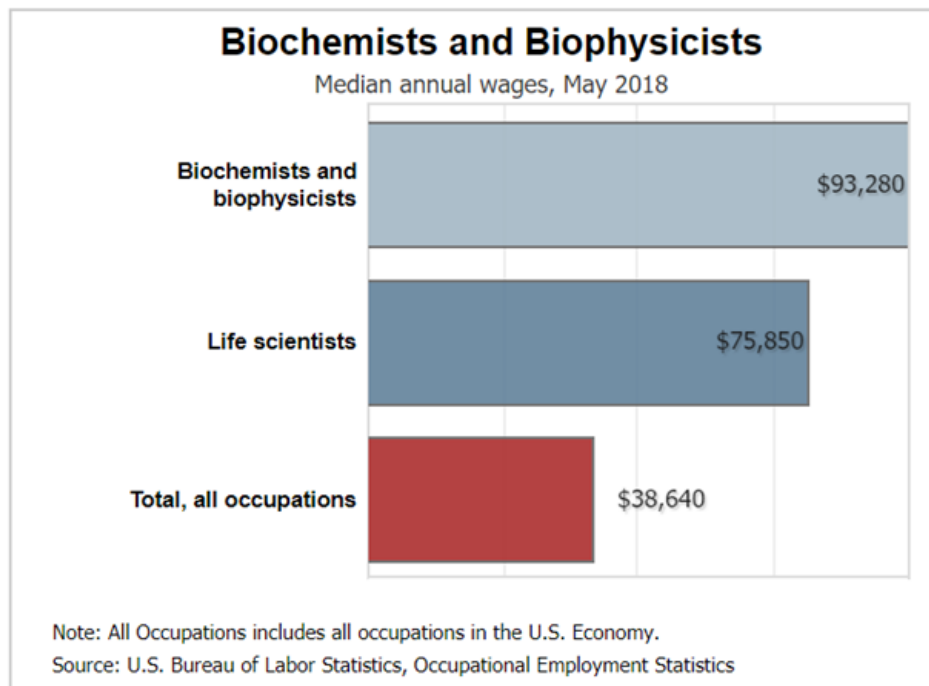
a) The need for the advancement and evolution of knowledge

Biochemistry is a field of study in which knowledge in chemistry is applied to living systems. The need to advance and evolve our knowledge in this field cannot be understated. The application of knowledge in Biochemistry has led to advances in the following areas which are critical for human health and well-being: 1) **Medicine** – understanding the pathology of diseases would not be possible without the understanding of genetics and biomolecular pathways; 2) **Pharmacy** – the study of drug stability, metabolism, and action would not be possible without an evolving knowledge of biochemistry; 3) **Nursing** – many of the everyday blood tests administered by nurses are biochemical tests that provide valuable information on cholesterol levels, organ function, blood sugar concentrations etc. Many of the groundbreaking discoveries in the fields listed above would not be possible without biochemical knowledge.

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

The application of knowledge in Biochemistry has also led to advances in of the following areas that are address *critical societal needs*: 1) **Nutrition** – understanding the role of nutrients, food chemistry, food testing, and food storage would not be possible without knowledge of Biochemistry; 2) **Agriculture** – the ability to prevent plant diseases, improve growth and yields of food crops, and monitor water and soil quality all require knowledge in Biochemistry.

With median salary ranges well above average, McDaniel's program will provide all graduates of the program the opportunity to begin a career in an established profession with excellent compensation:



It is important to note, however, that this program alone is not likely to be sufficient for a student interested in biochemistry as a career. The program itself is designed to provide students a strong background that can support their interests either in pursuing biochemistry through a PhD program, or following a different path that includes research, medical school or other health professions. In order to accomplish this preparation, the program offers laboratory coursework, research opportunities and support on finding internships. According to the Bureau of Labor, “most Ph.D. holders in biochemistry and biophysics have bachelor’s degrees in biochemistry or a related field... Additional laboratory coursework is excellent preparation for graduate school or for getting an entry-level position in industry. Students can gain valuable laboratory experience by working for a university’s laboratories. Occasionally, they can also gain such experience through internships with prospective employers, such as pharmaceutical and medicine manufacturers.” Our program is designed to provide this additional coursework and preparation which will give our graduates an advantage as they seek opportunities.

The importance of extensive preparation for highly compensated careers is especially important to the students of color at McDaniel College. The Fall 2019 entering class at McDaniel College is highly diverse:

- 34.6% African American
- 7% Hispanic
- 5.7% two or more races

According to the report *African Americans College Majors and Earnings* from the Georgetown University Center on Education and the Workforce (https://cew.georgetown.edu/wp-content/uploads/AfricanAmericanMajors_2016_web.pdf), black students are more

likely to choose majors that don't lead to lucrative careers. The report concludes that "African Americans represent 12 percent of the US population but are underrepresented in the number of degree holders in college majors associated with the fastest-growing, highest-paying occupations...STEM, health and business." By offering this program, we will have expanded the opportunity for our students of color and provided them a path that disrupts these major patterns and their corresponding socio-economic impact for students of color.

c) The need to strengthen and expand the capacity of historically black institutions to provide high quality and unique educational programs

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

We believe this program aligns with Strategy 8 of the Maryland State Plan for Postsecondary Education:

- Develop new partnerships between colleges and businesses to support workforce development and improve workforce readiness.

As Strategy 8 states, "the contemporary workplace is changing rapidly, and long-held beliefs about academic majors, career paths, and the connections between them have been transformed. More than ever, employers seek employees who have the flexibility to understand changing conditions and solve emerging problems. Technical knowledge is not enough." By housing a program that prepares students with scientific knowledge in a specific discipline but does so in an interdisciplinary way with a liberal arts core, our graduates will be uniquely positioned to impact the workforce. But the education is not enough. Direct relationship development with businesses that employ biochemists/researchers will be essential. To accomplish this, we will follow our already established models through the Center for Experience and Opportunity and our academic departments, such as interview days, undergraduate research, support for internships, and panels of local professionals (<https://www.mcdaniel.edu/information/headlines/news-at-mcdaniel/archive/summer-research-brings-student-team-scientific-recognition-and-lasting-frie>). These relationships will provide students direct access to employers while giving employers an opportunity to provide feedback on the program.

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

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

According to Department of Labor statistics, biochemist jobs in 2016 were distributed in the following industries:

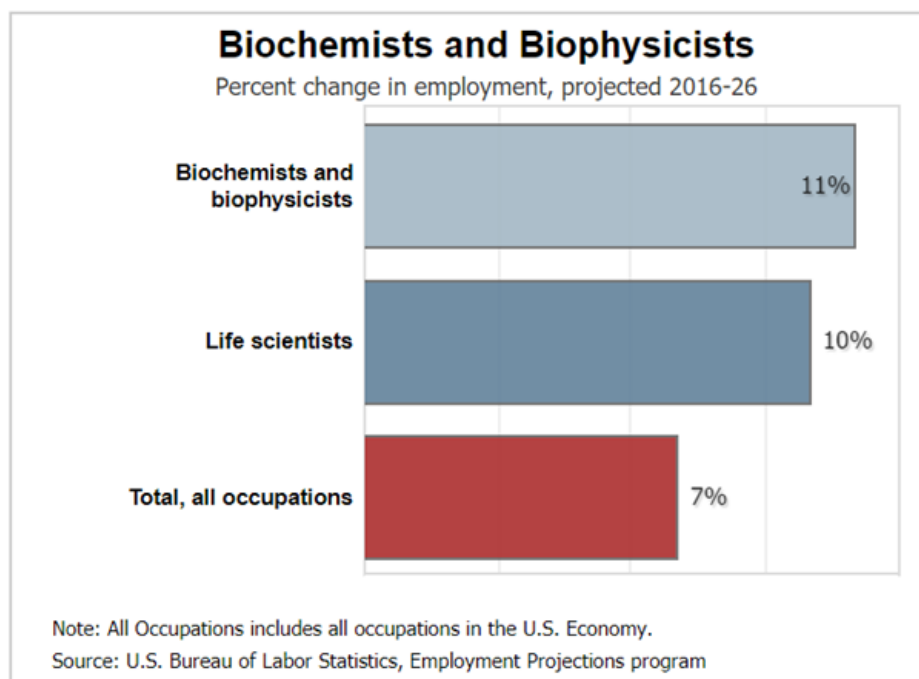
Colleges, universities, and professional schools; state, local, and private	15%
Pharmaceutical and medicine manufacturing	14
Wholesale trade	3
Management, scientific, and technical consulting services	3

Biochemists typically work in laboratories and offices, to conduct experiments and analyze the results.

Graduates of the McDaniel program will have strong core science knowledge with research experience, making them well-prepared to enter industry at the entry-level or to begin a doctoral program.

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

According to the Bureau of Labor Statistics, employment of biochemists is projected to grow 11 percent from 2016 to 2026, much faster than the average for all occupations.



The location quotient is the ratio of the area concentration of occupational employment to the national average concentration. A location quotient greater than one indicates the occupation has a higher share of employment than average, and a location quotient less than one indicates the occupation is less prevalent in the area than average.

The location quotient for biochemists in the state of Maryland is 1.83, among the five highest in the country.

States with the highest concentration of jobs and location quotients in this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
New Jersey	6,350	1.57	7.96	\$69.80	\$145,180
Massachusetts	4,650	1.30	6.61	\$50.31	\$104,650
Delaware	240	0.54	2.75	\$44.97	\$93,530
Maine	230	0.37	1.90	\$35.78	\$74,430
Maryland	970	0.36	1.83	\$47.78	\$99,370

Additionally, the location quotient for Delaware is 2.75, third highest in the country for biochemists. This is important because Delaware is proximate to Maryland, indicating additional opportunities for employment nearby.

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

The Bureau of Labor Statistics indicates that the employment change between 2016-2026 will be 2,600 positions.

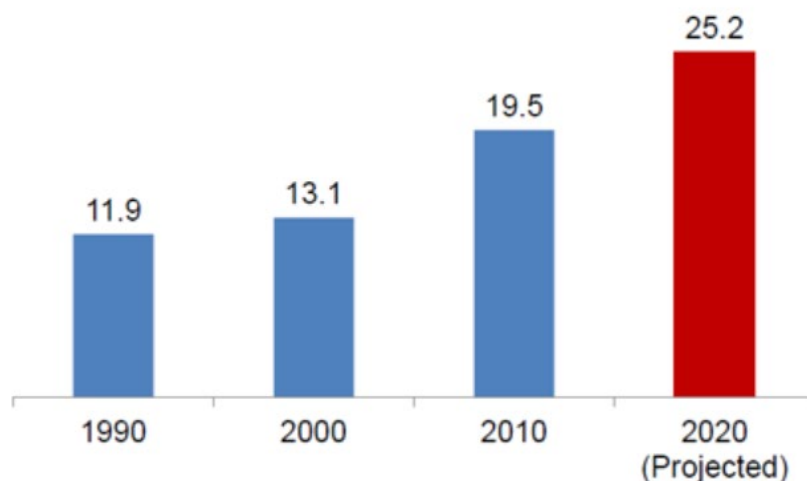
Summary

Quick Facts: Biochemists and Biophysicists	
2018 Median Pay ?	\$93,280 per year \$44.85 per hour
Typical Entry-Level Education ?	Doctoral or professional degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2016 ?	31,500
Job Outlook, 2016-26 ?	11% (Faster than average)
Employment Change, 2016-26 ?	3,600

Additionally, the impact of the aging workforce will be felt in the biochemistry field. Though specific vacancies in the field have not been projected, it is reasonable to assume that this field will not be exempt from this phenomenon.

Figure 1

Percent of the labor force 55 years & older



Source: **Toossi, M. 2012. "Labor Force Projections to 2020: A More Slowly Growing Workforce." *Monthly Labor Review* (January, 2010–2020).**

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

McDaniel's internal data reflects moderate interest in chemistry but strong interest in medical school and the health sciences. Additionally we have seen a significant percentage of our existing chemistry majors decide to pursue the biochemistry specialization, an indicator that there is a market within our existing students for this new program. 10.2% of the deposited students for the Fall 2019 class (62 total students) express their primary program of interest as Chemistry or express a desire to pursue medical school or a career in the health professions. These are students highly likely to have interest in the biochemistry program. An additional 80 students (13%) identify as Undecided and would be a group to introduce to the program.

Given our own internal interest and the number of college-bound students interested in biochemistry nationally (see section D.2 below), we project annual enrollment of no fewer than 7 students per year. Applying standard attrition patterns, we project a minimum of 5 graduates per year.

D. Reasonableness of Program Duplication:

1. Identify similar programs in the State and/or same geographical area. Discuss similarities and differences between the proposed program and others in the same degree to be awarded.

According to the State Academic Program Inventory, found at https://mhec.state.md.us/institutions_training/Pages/searchmajor.aspx, and the degree trend data downloadable from the MHEC website (http://data.mhec.state.md.us/Trend_Aux/DTRENDS18.zip), we offer the following information on Maryland schools with similar undergraduate programs:

- https://catalog.goucher.edu/preview_program.php?catoid=10&poid=1150&returnto=849
- <http://hood.smartcatalogiq.com/2018-2019/Catalog/Undergraduate-Studies/Undergraduate-Majors/Biochemistry-Major-B-A>
- http://catalog.msmary.edu/preview_program.php?catoid=6&poid=453&returnto=230
- <http://stevenson.smartcatalogiq.com/2018-2019/Undergraduate-Catalog/Fields-of-Study/Biochemistry>
- <https://catalog.towson.edu/undergraduate/fisher-science-mathematics/molecular-biology-biochemistry-bioinformatics/molecular-biology-biochemistry-bioinformatics/>
- [https://www.umes.edu/uploadedFiles/ WEBSITES/Schedule/Content/final%202015-16%20catalog.pdf](https://www.umes.edu/uploadedFiles/WEBSITES/Schedule/Content/final%202015-16%20catalog.pdf), page 127. This is the most up-to-date catalog available.
- <https://academiccatalog.umd.edu/undergraduate/colleges-schools/computer-mathematical-natural-sciences/chemistry-biochemistry/biochemistry-major/#requirementstext>
- https://catalog.umbc.edu/preview_program.php?catoid=22&poid=4012
- https://www.wau.edu/wp-content/uploads/2018/09/2018_2019_AcadBulletin-Web.pdf, page 225

While many of the Biochemistry programs listed above contain similar curricular offerings to our proposed major, the main difference is that *McDaniel will be one of the only Biochemistry majors that requires an experiential learning/internship in the core of the major*. Only Stevenson and Towson University require some sort of research/independent study in order to graduate. Goucher, University of Maryland, UMBC, Mount Saint Mary's and Washington College list independent study/research/internships in their catalog, but it is not a major requirement. Hood does not list independent study/research/internships in their Biochemistry program or course catalog.

2. Provide justification for the proposed program.

As mentioned above, the primary justification for this proposed major is that *McDaniel will be one of the only Biochemistry majors in our area that requires an experiential learning/internship in the core of the major*. We have the capability to make this a requirement because the faculty as listed in G-1 below all have research interests either directly or peripherally related to Biochemistry. As mentioned above, this independent research requirement will allow our students to obtain the experience necessary to gain admission to graduate programs and succeed in the biochemical workforce thus justifying the creation of this major.

Additionally, according to the College Board Student Search Service, a data pool that covers nearly 90 percent of all college-bound students, out of the students planning to enroll in college in fall 2019, 13,429 indicated an intended major of "biochemistry." When adding an intended major of *Biological and Biomedical Sciences* (note that this does not crossover with the more general *Biology* major and is its own program), that number increases significantly to 56,409. There are more than 2,600 students in Maryland, Virginia, and Pennsylvania alone. Given the national interest in this field along with our internal student demand as demonstrated through current students who enroll in the existing specialization, we believe the benefits of the program are clear.

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

1. Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBI's.

N/A

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

1. Discuss the program's potential impact on the uniqueness and institutional identities and missions of HBIs.

N/A

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

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

A large portion of the curriculum for this major already exists at McDaniel, but it is currently under a Chemistry major with a Biochemistry specialization. The impetus for replacing this specialization track with a Biochemistry major is to better serve our students. The program will be overseen by the Chemistry department as the current specialization is. The franchised faculty that will oversee this program are as listed below:

Dr. Dana Ferraris, Associate Professor of Chemistry, Department Chair – areas of research include oncology and antibiotic based medicinal chemistry.

Dr. Peter Craig, Associate Professor of Chemistry – areas of research include synthesis and testing of transition metal-based pharmaceuticals.

Dr. Melanie Nilsson, Associate Professor of Chemistry – area of research includes studying the folding of beta amyloid fibrils and pathology of Alzheimers.

Dr. Stephanie Homan, Assistant Professor of Chemistry – area of research includes design and synthesis of nanoparticles as biological materials.

All of the faculty overseeing this program have research agendas that encompass some aspect of biochemistry to better support the independent research experience required in the proposed Biochemistry major.

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

Upon completion of the Biochemistry major, students will:

1. Demonstrate foundational knowledge in several branches related to biochemistry including Organic Chemistry, Bioinorganic Chemistry, Bioanalytical Chemistry, and Physical Chemistry.
2. Understand and apply mathematical methods and error analysis at levels appropriate to various types of Biochemical data.
3. Apply the scientific process, tools, and techniques to solve problems.
4. Critically read and evaluate scientific literature and communicate scientific findings in written, oral, and visual presentations in a fashion that is clear, well organized, and properly documented.
5. Demonstrate professional skills and behaviors consistent with careers in the chemical sciences.

6. Understand the role of ethics, diversity, and globalism in biochemistry and biochemical investigation

3. Explain how the institution will:

a) provide for assessment of student achievement of learning outcomes in the program
Student achievement of learning outcomes in the program is overseen by the Academic Assessment Committee (AAC) as part of McDaniel's established faculty governance. This committee of five full-time teaching faculty is charged with fostering sound assessment of the College's academic programs, encouraging the collection of data that leads to action, and collecting departmental assessment plans and reports and responding to them as necessary. The program will provide a list of learning outcomes to the AAC along with a chart indicating the specific courses in which each outcome is developed as well as courses that serve as points of assessment. In the fall of each academic year, the program will select an outcome (or outcomes) to assess and provide a detailed plan for direct and indirect assessment to the AAC; the AAC will provide feedback on this plan, as needed. All the department's learning outcomes will be revisited and assessed on a regular basis so that changes made based on past assessments can be evaluated.

b) document student achievement of learning outcomes in the program
In the spring of each academic year, the program will document the degree to which students achieved the learning outcomes in the program by providing a report on the assessment of these outcomes to the AAC, based on the assessment plan submitted earlier in the year. These reports will include the assessment findings as well as a proposed plan of ways to address any areas in which students did not successfully meet the learning outcomes set forth by the department.

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

Proposed Chemistry/Biochemistry Specialization and Biochemistry Major

Chemistry/Biochemistry specialization (Current)			Biochemistry Major (Reorientation)		
Courses		credits	Courses		credits
General Chemistry 1	CHE1103	4	General Chemistry 1	CHE1103	4
General Chemistry 2	CHE1104	4	General Chemistry 2	CHE1104	4
Principals of Biology	BIO1111	4	Principals of Biology	BIO1111	4
Topics in Biology	BIO1117	4	Topics in Biology	BIO1117	4
-	-	-	Molecular Biology	BIO2208	4
Organic Chemistry 1	CHE2217	4	Organic Chemistry 1	CHE2217	4
Organic Chemistry 2	CHE2218	4	Organic Chemistry 2	CHE2218	4
Biochemistry 1	CHE3321	4	Biochemistry 1	CHE3321	4
Biochemistry 2	CHE3322	4	Biochemistry 2	CHE3322	4
Metalloproteins, (Inorganic)	CHE2206	4	Bioinorganic Chemistry	CHE2206	4
Chemical Analysis (analytical chem)	CHE2208	4	Bioanalytical Chemistry	CHE2208	4
Calculus 1	MAT1117	4	Calculus 1 or Statistics	MAT1117 or STA2215	4
Physical Chemistry 1	CHE3307	4	Physical Chemistry for Biological Science	CHE3307	4
Chemical Literature/Science Writing	CHE3205	2	Chemical Literature/Science Writing	CHE3205	2
Senior Seminar	CHE4493	2	Senior Seminar	CHE4493	2
-	-	-	Laboratory Research Independent Study	CHE4498	4
-	-	-			
Three additional courses from 2000-3000 level biology or chemistry		12	One additional course from 2000-3000 level biology or chemistry		4
	Total Credits	64		Total Credits	64
			Strongly Recommended Courses		
			Statistics	STA2215	4
			Physics I (General or Introductory)	PHY 1104 or PHY 1114	4
			Physics 2 (General or Introductory)	PHY 1105? or PHY 1115?	4
			Introduction to Sociology	SOC 1104	4
			Introduction to Psychology	PSY 1106	4

Additional credits outside for the Major

Type of Course	Details	Credits
First Year Seminar	General education requirement	4
ENG 1101	Introduction to College Writing, general education requirement	4
Writing in the Discipline	Majors meet this general education requirement by completing CHE 3205 and other writing intensive courses required in the major.	Credits included in the major
Second Language	General education requirement is 2 semesters in the same language or placement/proficiency above the 2 nd semester level.	8
Multicultural	Category of courses for general education requirement	4
International Nonwestern	Category of courses for general education requirement	4
International Western OR Nonwestern	Choice of 2 categories of courses for general education requirement	4
Quantitative Reasoning	Majors will take STA 2215 to complete this general education requirement	Credits included in the major
Scientific Inquiry with	Majors will take BIO 1111 to complete this general education	Credits

Lab	requirement	included in the major
Quantitative Reasoning OR Scientific Inquiry	Majors will take CHE 1103 to complete this general education requirement	Credits included in the major
Textual Analysis	Category of courses for general education requirement	4
Creative Expression	Category of courses for general education requirement	4
Social, Cultural, Historical Understanding	Category of courses for general education requirement	4
Physical Activity & Wellness	General education requirement is 1 credit of physical activity courses OR participation in intercollegiate sports, ROTC, or some other approved experience.	0-1
Jan Term	General education requirement of 1 course during a January Term. Most students complete this by taking My Design.	2
My Career	General education requirement	1
Experiential Learning	General education requirement is that students complete credited or non-credited experiential learning which could include courses, internships, experiential independent studies, or study abroad.	0-4
Total number of general education credits outside of the major		43-48
Remaining elective courses (these could count toward a minor, another major, and/or elective credit)		16-21
Combined credits from general education and elective coursework		64
Total number of credits from the major (see previous table)		64
Total number of credits required for the B.A. degree		128

COURSE DESCRIPTIONS FOR THE MAJOR:

CHE 1103 - General Chemistry I: Structure and Bonding

Credits: 4

The first half of the two-semester, general chemistry sequence is designed primarily for those students who are interested in majoring in the sciences and have sufficiently solid backgrounds in science and mathematics to allow for a more in-depth investigation of the field. The course includes an introduction to the scientific method and its application to the study of chemistry and the properties of matter. The structure of matter at the atomic level is then presented in detail from the standpoint of modern atomic and molecular theory. This includes a description of the electronic structure of atoms and their relation to the periodic table, mass relationships, ionic and covalent bond formation and the theories used to explain molecular shape and molecular interactions. Finally, the major classes of chemical reactions and their associated energy changes will be explored including techniques used to balance chemical equations and the use of stoichiometry to make quantitative predictions. The laboratory focuses on the

observation of physical properties of matter and chemical reactions by conventional and instrumental methods, and the application of these observations in a problem-solving environment. Course includes a 3-hr laboratory.

Prerequisites Mathematics 1001 and 1002

Co-requisite Chemistry 1001

Recommended Co-requisite Mathematics 1107 or above

McDaniel Plan: *Scientific Inquiry with Laboratory*

CHE 1104 - General Chemistry II: Chemical Reactivity

Credits: 4

The second half of the two-semester, general chemistry sequence is designed primarily for those students who are interested in majoring in the sciences and have sufficiently solid backgrounds in science and mathematics to allow for a more in-depth investigation of the field. The course starts with an overview of the physical properties of solids, liquids and gases and how they can be interpreted using kinetic molecular theory. Major topics also include an introduction to chemical kinetics, the principles of chemical equilibrium, and chemical thermodynamics. Finally, a detailed study of two important classes of reactions, acid-base and reduction-oxidation, will be covered. In the laboratory, students explore gases, solutions, kinetics, and equilibrium, using conventional and instrumental techniques, applying their skills in a problem-solving environment. Course includes a 3-hr laboratory.

Prerequisites Chemistry 1101 or Chemistry 1103 and Mathematics 1001 and Mathematics 1002

Co-requisite Chemistry 1002

Recommended Co-requisite Mathematics 1107 or above

McDaniel Plan: *Scientific Inquiry with Laboratory.*

BIO 1111 - Principles of Biology

Credits: 4

This course is intended for prospective science majors and is required before all Biology courses at the 2000 level or above. It focuses on unifying themes and principles including evolution and the relationship of structure to function. The laboratory emphasizes basic skills and is an integral component of the semester. Course includes laboratory.

Required before any Biology courses at the 2000 level or above; may be taken in either the first or second semester.

Note: An AP score of 4 or 5 may allow waiver of a second 1000-level Biology course, but not of Biology 1111

McDaniel Plan: *Scientific Inquiry with Laboratory*

BIO 1117 - Topics in Biology

Credits: 4

This course is the second introductory course in the Biology major. In it students will continue to explore the principles of biology established in the first semester course, but within the narrower focus of a topic that varies by instructor. Besides mastering course content, students will also develop some of the skills of successful scientists, such as critically reading scientific literature, learning the basic conventions of writing in biology, or interpreting experimental data.

Prerequisites Biology 1111

McDaniel Plan: *Scientific Inquiry*

BIO 2208 - Molecular Biology

Credits: 4

An introduction to the theory and methodology of molecular biology. The transition from DNA to RNA to protein will be explored along with a basic toolkit of laboratory techniques that are used in their analysis. There will also be an introduction to bioinformatics and genomics.

Prerequisites BIO-1111 and BIO-1117

CHE 2217 - Organic Chemistry I

Credits: 4

A systematic study of the compounds of carbon based upon functional reactivity with emphasis on the physicochemical approach to reaction mechanisms. In addition to a treatment of basic molecular structure, stereochemistry, equilibria, kinetics and nomenclature, the chemistry of alkanes, alkenes, alkynes, aromatics, and alkyl halides is studied. A coordinated laboratory incorporates classical techniques (recrystallization, distillation, and extraction), analytical methods (chromatography and IR spectroscopy), and molecular modeling. Course includes a 4-hr laboratory.

Prerequisites Chemistry 1102 or 1104

Co-requisite Chemistry 2017

CHE 2218 - Organic Chemistry II

Credits: 4

A systematic study of the compounds of carbon based upon functional reactivity with emphasis on the physicochemical approach to reaction mechanisms. With continued emphasis upon mechanisms, the chemistry of alcohols, ethers, phenols, carboxylic acids and their derivatives, amines, carbohydrates, and amino acids is studied. A coordinated laboratory incorporates NMR spectroscopy, molecular modeling, micro and macro scale synthesis, and scientific writing. Course includes a 4-hr laboratory.

Prerequisites Chemistry 2217

Co-requisite Chemistry 2018

CHE 3321 - Biochemistry I

Credits: 4

This course provides an exploration of cellular function on a molecular level. The major focus of the course is on protein chemistry; topics include protein structure, folding, synthesis, and function. Skills such as technical writing, database information retrieval, data analysis, and critical thinking are highlighted. The laboratory is research-based and will primarily explore the relationship between protein misfolding and human disease. Techniques include protein purification, electrophoresis, and spectroscopic characterization. Course includes a 4-hr laboratory.

Prerequisites Chemistry 2217 and Biology 1111;

Co-requisite Chemistry 3021

Recommended Chemistry 2218 and 3205

CHE 3322 - Biochemistry II

Credits: 4

This advanced biochemistry course will highlight important topics at the interface of biology and chemistry. Topics may include an in-depth examination or extension of topics covered in CHE 3321 (Biochemistry I), new cutting-edge topics and techniques, and/or historical perspectives of important developments in biochemistry. Past topics have included rational drug design, complementary and alternative medicine, biomineralization, and the protein-folding problem. Oral presentation skills and critical analysis of the primary literature are emphasized.

Prerequisites CHE 3321

CHE 2206 – Bioinorganic Chemistry

Credits: 4

Modern inorganic chemistry encompasses the study of compounds with a broad diversity of reactivities, structures and bonding types. These have widespread relevance for many other areas of science and technology such as metals in medicine (anticancer drugs), material science (superconductivity), and heavy metal remediation (nuclear waste and fuel rod reprocessing). This course focuses on three topics (coordination chemistry, solid-state chemistry, and descriptive chemistry of representative elements), and applies them to real world applications. The associated laboratory comprises two components: guided inquiry experiments, and open inquiry experiments. The guided inquiry experiments provide students with experience in synthesis and measurement of physical properties for selected inorganic compounds. The open inquiry experiments involve students designing and undertaking experiments on biologically and environmentally related inorganic themes. Course includes 4-hour laboratory.

Prerequisites Chemistry 1102 or 1104

CHE 2208 – Bioanalytical Chemistry

Credits: 4

An introduction to physico-chemical principles and techniques underlying a wide range of modern analytical methods used in chemistry. Such methods are applied in areas as diverse as forensics, archeology, environmental monitoring, and space science. Topics include chromatographic methods for the separation of complex mixtures, application of modern electrochemical and spectroscopic techniques to analytical problems, and methods for assessing the reliability of results. The associated laboratory is an integral part of this course. It comprises two components: guided inquiry experiments, and open inquiry experiments. The guided inquiry experiments illustrate major analytical techniques to students. The open inquiry experiments involve students designing and undertaking experiments on biologically and environmentally related analytical themes. Course includes 4-hour laboratory.

Prerequisites Chemistry 1102 or 1104

MAT 1117 - Calculus I

Credits: 4

Initial study of limits, derivatives and integrals; review of trigonometric functions; differentiation techniques and formulas applied to rational and trigonometric functions; applications of derivatives including curve sketching; extrema and rate problems; definition of the integral; elementary applications of integrals.

Prerequisites Mathematics 1107 or placement by the Department.

McDaniel Plan: *Quantitative Reasoning.*

STA 2215 - Introduction to Statistics

Credits: 4

Basic statistical principles and techniques; summarizing and presenting data, measuring central tendency and dispersion in data, basic concepts of probability and probability distributions, estimation of parameters and testing of hypotheses through statistical inference, linear regression and simple correlation.

Prerequisites Mathematics 1001, Mathematics 1002 or placement above MAT 1002.

McDaniel Plan: *Quantitative Reasoning*

CHE 3307 - Foundations of Physical Chemistry

Credits: 4

This course covers the fundamental theories of physical chemistry and their application to chemical and biological systems. Specifically, students will be exposed to three different sets of theories including the theories of quantum mechanics and their application to electronic and molecule structure and spectroscopy; thermodynamics theories and their application to energy transfer and chemical and physical equilibrium; and finally kinetic theories and their application to molecular motion, transport properties and chemical reaction rates. The associated laboratory provides hand-on experience to students through the use of experiments that illustrate the application of each of the important theories covered in lecture to real chemical and biological systems. Course includes a 4-hr laboratory.

Prerequisites Chemistry 1102 or 1104 and Mathematics 1117

CHE 3205 - The Chemical Literature

Credits: 2

An introduction to modern searching of the scientific literature using electronic databases, including Chemical Abstracts. Specific instruction is given in the techniques and strategies used in searching subjects, authors, and substances in retrospective, forward, and relational databases. As a culminating experience in this course, students will perform a comprehensive literature search on a subject and then produce a concise review of the topic.

This course contributes to the departmental writing requirement for all major programs of study offered by the Department of Chemistry.

CHE 4493 - Chemistry Seminar

Credits: 2

Presentation of laboratory or literature findings on current topics of chemical interest by students, faculty, and visiting lecturers. This course is the Capstone Experience in Chemistry and is required of all senior Chemistry and Biochemistry majors and Exercise Chemistry dual majors. Juniors and non-majors may be admitted by permission of the department.

This course satisfies the capstone requirement for all major programs of study offered by the Department of Chemistry.

Prerequisites Chemistry 3205

CHE 4498 - Independent Studies in Chemistry

Credits: 4

Directed study planned and conducted with reference to the needs of those students who are candidates for departmental honors. Qualified students who are not candidates for such honors but who desire to do independent studies are also admitted with permission of the Department.

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

Of the 64 credits proposed for the Biochemistry major, 12 credits fulfill general education requirements for all students. These include:

- a) 2 courses which will fulfill the Scientific Inquiry with lab requirements: Principles of Biology with lab (BIO 1111 and BIO 1001, 4 credits) and General Chemistry I with lab (CHE 1103 and CHE 1001, 4 credits);
- b) 1 course will fulfill the Quantitative Reasoning requirement: Introduction to Statistics (STA 2215, 4 credits);

Students will complete their remaining general education requirements outside of their major.

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

N/A

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

N/A

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

The college catalog includes information on approved programs including all required coursework and total program hours. The catalog also addresses degree and McDaniel Plan (general education) requirements for students.

The Schedule of Classes for each semester outlines how classes are offered and the nature of faculty/student interaction—face-to-face, online, or hybrid. The learning management system for the online and hybrid classes is Blackboard. When student accounts are created, students receive an automated email that contains information about Blackboard and the system requirements. This information is in the student's inbox when they first access their email. If specific technological competencies or skills are required for any courses within the approved program, this information is outlined in the course description.

The college website and intranet contain pertinent information about student support services, including academic support, financial aid, tuition and fees, billing and payment, and policies relating to each.

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

At McDaniel College, recruitment materials are updated annually. This provides the college flexibility to ensure accuracy.

Additionally, it is the habit of the Office of Admissions to introduce prospective students to departmental faculty when possible. Campus visits include the opportunity to sit in on a class or to meet with faculty (<https://www.mcdaniel.edu/undergraduate/admissions/visit-mcdaniel>). Emails written by department chairs are deployed by the Office of Admission and admitted student events feature one-hour sessions that give faculty and current students an opportunity to share details about the major.

The college's website is currently undergoing a complete redesign, but departmental practice in the Office of Communication and Marketing is to review academic program pages monthly for accurate content. Academic pages link to the most recent version of the college's catalog, giving prospective students a clear and accurate view of the program requirements and coursework (<https://www.mcdaniel.edu/undergraduate/the-mcdaniel-plan/departments/chemistry>)

H. Adequacy of Articulation

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

N/A

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

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

Consistent with COMAR 13B.02.03.11, all full-time faculty teaching in the Biochemistry major hold the highest degrees in their fields. Part-time faculty and adjunct faculty possess at least Master's degrees and relevant certifications in their fields (bringing real-world experience into the classroom). Full-time faculty and part-time faculty collaborate in teaching, program development, program assessment, and student academic support.

Name	Terminal Degree Title and Field	Academic Title/Rank	Status	Courses Taught in Health Sciences major
Ferraris, Dana	Ph.D., Chemistry	Associate Professor of Chemistry	Full-time faculty	CHE 2217: Organic Chemistry I, CHE 2218: Organic Chemistry II, CHE 2017: Organic Chemistry Lab I, CHE 2018: Organic Chemistry Lab II, CHE3301: Medicinal Chemistry, CHE3205: Chemical Literature, CHE4493: Chemistry Seminar, CHE4498: Independent study Research
Homan, Stephanie	Ph.D., Chemistry	Assistant Professor of Chemistry	Full-time faculty	CHE 1103: General Chemistry I, CHE 1104: General Chemistry II, CHE 1001: General Chemistry I Lab, CHE 1002: General Chemistry II Lab, CHE4493 Chemistry Seminar, CHE3307: Physical Chemistry for the Life Sciences, CHE4493:

				Chemistry Seminar, CHE4498: Independent study Research
Polen, Michael	Ph.D., Chemistry	Lecturer of Chemistry	Full-time faculty	CHE 1103: General Chemistry I, CHE 1104: General Chemistry II, CHE 1001: General Chemistry I Lab, CHE 1002: General Chemistry II Lab
Craig, Peter	Ph.D., Chemistry	Associate Professor of Chemistry	Full-time faculty	CHE 1103: General Chemistry I, CHE 1104: General Chemistry II, CHE 1001: General Chemistry I Lab, CHE 1002: General Chemistry II Lab, CHE 2206: Bioinorganic Chemistry, CHE2208: Bioanalytical Chemistry, CHE3205: Chemical Literature, CHE4498: Independent study Research, CHE4493: Chemistry Seminar
Nilsson, Melanie	Ph.D., Chemistry	Associate Professor of Chemistry	Full-time faculty	CHE 3321: Biochemistry I, CHE 3021: Biochemistry I Lab, CHE3322: Biochemistry II, CHE3022: Biochemistry II Lab, CHE4493: Chemistry Seminar, CHE4498, Independent study Research
Huang, Cheng	Ph.D., Molecular Genetics	Associate Professor of Biology	Full-time faculty	BIO 1111: Principles of Biology, BIO2208:Molecular Biology,
Parrish, Susan	Ph.D., Molecular Biology	Associate Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO2208: Molecular Biology
Morrison, Randall	Ph.D. Biology	Professor of Biology	Full-time faculty	BIO1117: Topics in Biology
Staab, Katie	Ph.D. Biology	Associate Professor of Biology	Full-time faculty	BIO1111: Principles of Biology
Martinson, Holly	Ph.D. Biology	Assistant Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO1117: Topics in Biology
Burley, Heather	Ph.D., Animal Science	Lecturer	Part-time faculty	BIO 1101: Principles of Biology Lab, BIO 1117: Topics in Biology
Seidel, Ethan	Ph.D., Monetary Theory, Public Finance	Professor of Business Administration	Full-time faculty	STA 2215: Statistics
Simonelli, Italo	Ph.D. Mathematics	Professor of Mathematics	Full-time faculty	MAT1117: Calculus I

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

a) Pedagogy that meets the needs of the students

McDaniel College prides itself on its excellent instruction and therefore provides many forms of faculty development to support professors in all stages of their careers. New faculty participate in a year-long orientation program of monthly professional

development events which include a focus on evidence-based practices. Every August, new and returning faculty attend a day-long faculty development retreat which includes concurrent sessions on various topics including diversity, students with learning differences, evidence-based research about teaching and learning, best practices for hybrid and online teaching, handling challenging classroom situations, etc. Throughout the academic year, we offer 1 to 2 faculty development sessions each month which are open to all faculty. Each year, we run a faculty book group/learning community which approximately one third of our full-time faculty participate in; the book is always one which highlights evidenced-based practices. In addition to the group-based forms of faculty development described above, the institution also provides one-on-one support to faculty who would like to receive formative feedback on their teaching through class observations and/or moderated focus groups with their students.

b) The learning management system

The Department of Instructional Design and Technology at McDaniel College offers the following resources to support faculty use of Blackboard: (a) 60-minute workshops throughout the year on Blackboard Basic, Intermediate, and Advanced features; (b) one-on-one Blackboard training for all new faculty members and anyone else who requests it; (c) a range of course design templates that enable/encourage backward design, outcome alignment, authentic assessment, appropriate rubrics, and a range of student-centered pedagogical methods; and (d) professional development lunch events about matters of instructional design.

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

All faculty who teach an online course are required to first take BPO 100: *Best Practices in Online Teaching and Learning*, a four-week (28-hour commitment) online course. By completing the course, participants (a) gain the benefit of the experience, research, and knowledge from those individuals and institutions who have been offering online instruction for many years, (b) develop specific strategies for maintaining social presence, teaching presence, and cognitive presence in an online classroom, and (c) develop specific strategies for facilitating collaboration, reflection, and learner-centered pedagogies. BPO 100--a constructivist, discussion-based class--is informed by the Community of Inquiry framework and standard best practices as measured by Quality Matters.

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

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

McDaniel College's Hoover Library contains approximately 375,038 book volumes, access to 87 different databases, 77,676 titles of media, and 84,516 serials. The Hoover Library website (<http://hoover.mcdaniel.edu>) includes Research Guides—general and course specific—that assist students with identifying appropriate resources for academic writing. The guides also provide general assistance with the research process by covering topics such as source selection and evaluation.

The College's print collection is available for loan to all McDaniel College students, faculty, staff, and other community members. The library's website provides remote access to the online catalog and electronic databases so that students may access the library's resources from wherever they are working. No-fee interlibrary loans and document delivery from other institutions supplement the collection in support of research and classroom projects.

As part of the Carroll Library Partnership, Hoover Library shares an online catalog with Carroll County Public Library and Carroll Community College. Students, faculty, and staff may use, request, and check out titles from any of the three collections. This arrangement makes an additional 700,000 volumes available to the McDaniel College community. McDaniel College students and faculty also have borrowing privileges at participating libraries at institutions in the Maryland Independent Colleges and Universities Association (MICUA), the Baltimore Area Library Consortium (BALC), and the Associated College Libraries of Central Pennsylvania (ACLCP).

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

1. Provide an assurance that physical facilities, infrastructure and instruction equipment are adequate to initiate the program, particularly as related to spaces for classrooms, staff and faculty offices, and laboratories for studies in the technologies and sciences.

The Chemistry, Biology, and Math Departments operate in Eaton Hall, Lewis Hall of Science and Lewis Recitation Hall which includes 40 offices, 15 classrooms, 20 laboratories, and 6 multi-use conference/meeting spaces. All classrooms are equipped with live internet connection, LCD projectors, VCRs, DVDs and computers. Smart Boards are available in several classrooms on each floor.

Because the majority of the courses in this proposed program are offered as part of active majors (e.g. Chemistry, Biology, Math etc.) McDaniel College does not expect a significant impact on the College's facilities and equipment.

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

a) An institutional electronic mailing system, and

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

All McDaniel students are provided with email accounts. The institution uses Blackboard for course delivery, community engagement, and content management for all face-to-face and online courses. Our Blackboard system is fully integrated with our Student Information System (SIS), such that (a) all students and faculty automatically have Blackboard accounts, (b) all classes are automatically built, and (c) all enrollments are automatically managed via SIS integration.

Instructors and students utilize iDevices, Adobe Connect, Ensemble, video from Hoover Library databases, and fast Internet connections. The Student Academic Support Services (SASS) office provides on-loan assistive technology to students. The Instructional Technology Office provides training and support for faculty and students

using any technology used in the course. The department has adequate information technology resources to support faculty and students.

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

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

Rationale for enrollment projections

New student enrollment projections embedded in our strategic enrollment plans are developed by the Vice President for Enrollment. They are based on the VP's review of historical enrollment data in similar fields at McDaniel College, the size of the potential market in primary recruitment areas for the college, and enrollment trends nationally.

Rationale for reallocated funds

Last year, the College underwent a faculty-led review in response to a request from the McDaniel Board of Trustees to identify academic programs for possible reinvestment, as well as potential restructuring. The goal of this review was to strengthen the academic program of the College by aligning our academic offerings with current and prospective students' demonstrated interests.

In the spring of 2019, the Board of Trustees unanimously approved the recommendations that would suspend enrollment for future students in the following undergraduate majors: Art History, Religious Studies, French, German and Music. Minors in German, Music and Latin will also no longer be offered. These programs were selected, in large part, due to relative under-enrollment compared with other programs at the College.

The following chart indicates the number of students who were in the pipeline and in our prospective student pool as of November of 2018:

Program	5-yr avg. degrees	Current majors	Current minors	F19 Admissions projections Apps→Admits→Yield
Art History Major (minor retained)	4.6	4	4	N/A: Art History not in survey General Art = 6 students
Religious Studies Major (minor retained)	1.6	7	10	8 apps → 5 admits → 1 student
French Major (minor retained)	3.8	8	6	9 apps → 6 admits → 1 student
German Major and Minor	2.2	12	5	2 apps → 1 admits → 0 students
Music Major and Minor (select music activities retained)	3.2	13	8	32 apps → 21 admits → 4 students

Any prospective students who indicated an interest in these majors were notified of the program suspensions in advance of making their decision to enroll. The College guaranteed that

all students who had declared a major in an impacted program would be able to graduate with their intended degree. McDaniel students were allowed to declare any major through the end of this spring semester regardless of whether there was a recommendation to suspend. And in every case except for German and Latin, courses will still be taught in these disciplines and students will be able to use these courses to fulfill their core education (McDaniel Plan) requirements. Specifically related to Music, select performance opportunities that have existed for all students, regardless of major, will still be available, including choir and band, as well as music lessons. Students can still select from five second languages: Arabic, ASL, Chinese, French, and Spanish.

Because of our commitment that all students in an affected major can graduate with their intended degree, existing faculty may continue to teach in the affected programs of study for a number of years. The College is closely following American Association of University Professors (AAUP) guidelines.

The recommendations approved by the board resulted in nearly a million dollars worth of savings over the next five years, 100% of which will be re-invested to strengthen our academic programs. Investments will support the reorientation of existing programs to better meet the needs of the 21st century, and to create new programs that will expand the curricular offerings of the College. This was not a budget cut.

The Board also voted to investigate these strategic re-investments in four categories of strong and growing interest to current and prospective students: Health Sciences/STEM, Business and Technology, the Liberal Arts core curriculum, and professional certificates.

None of these changes will adversely affect our ability to deliver our hallmark McDaniel Plan and McDaniel Commitment. Our students will continue to experience a broad education in the liberal arts and sciences while delving deeply into their program areas of special interest.

2. Complete Table 2: Program Expenditures and Narrative Rationale. Provide finance data for the first five years of program implementation. Enter figures into each cell and provide a total for each year. Also provide a narrative rationale for each expenditure category.

FTE & operating budget calculations were based upon existing departments which will contribute at least 25% of the courses in the proposed major. Using only those high-contributing departments, FTE & operating budgets were then calculated based on proportionate contributions.

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

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

Courses are evaluated via online student course evaluations which are reviewed by department chair and the individual faculty member at the end of each semester; these evaluations include quantitative and qualitative components. Programmatic student learning outcomes are assessed via direct and indirect measures under the guidance of the standing Academic Assessment Committee as described in G.3

Faculty teaching in the program will be evaluated in accordance with the faculty evaluation procedures of McDaniel College specified in the McDaniel College Faculty Handbook. At the time when franchised faculty are eligible for reappointment, tenure, promotion, or periodic review, the faculty member critically evaluates his or her performance as a teacher, reviews course evaluations, and provides evidence of effective teaching, service to the college, and scholarly and/or professional activity. The 5 elected members of the Faculty Affairs Committee review the materials submitted by the faculty member as well as the student course evaluations, rate the candidate's performance, and make a recommendation to the Provost for employment action. Adjunct faculty are reviewed by their department chair on a regular basis; adjunct faculty are evaluated based on their course evaluations and other materials they may submit to document their teaching effectiveness.

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

In addition to the annual assessments of student learning outcomes overseen by the Academic Assessment Committee described earlier (see G.3), the program will engage in a periodic program review. The program review process is overseen by the Academic Planning Committee (APC) – a standing committee that is part of our faculty governance system. Faculty who teach in the program will prepare a self-study that includes data about course and program enrollment, faculty professional activity, student retention/graduation rates, assessments of student learning outcomes, alumni outcomes and satisfaction, a comparison of the program to similar programs at other colleges, nationwide trends in the discipline, an evaluation of the current strengths and challenges of the program, and a five-year strategic plan. The self-study is reviewed by the APC and feedback is provided. External consultants review the self-study and make an on-site visit to further evaluate the program's educational effectiveness and make recommendations based for improvement. The last step of this year-long review process is the revision of the five-year plan to address any weaknesses or areas of improvement.

The student body is surveyed using several different methods. Annually, we complete the Higher Education Data Sharing (HEDS) Consortium's "Senior Survey," which asks seniors to report on five dimensions of their undergraduate experience: good teaching and high-quality Interactions with faculty, challenging assignments and high faculty expectations, interactions with diversity, growth on intellectual outcomes, and growth on civic outcomes. Secondly, we use the Student Satisfaction Inventory (SSI) from Ruffalo Noel Levitz, which measures student satisfaction and which issues are most important to them. Finally, we also utilize the National Survey of Student Engagement (NSSE), which looks at engagement indicators and high-impact practices. With each of these assessment methods, data can be disaggregated to a departmental/programmatic level. These reports are provided to department chairs for integration into their own assessment plans and departmental reviews as a measure of student satisfaction.

Regarding cost effectiveness, McDaniel College engages in a strategic planning process to determine the viability of its programs. This process involves developing a unique Strategic Enrollment Plan (SEP) for the program. As defined by Ruffalo Noel Levitz, Strategic Enrollment Planning is "a data-informed process that aligns an institution's fiscal, academic, co-curricular,

and enrollment resources with its changing environment to accomplish the institution's mission and ensure the institution's long-term enrollment success and fiscal health." At McDaniel, this means each proposed academic program is reviewed through the lens of not only curricular innovation and mission alignment, but also program demand, departmental costs, investment needs, and long-term viability. This data is reviewed by the Provost and a faculty committee whose focus is strategic planning and the budgetary health of the institution. This program was developed with the assumption that the program could continue to be sustained through existing institutional resources, but with plans for increased investments when the expected program growth occurs.

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

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

McDaniel College is committed to minority student access and success. In accordance with this commitment, the College has articulated cultural diversity goals which include general education courses related to cultural diversity, co-curricular student programming, and faculty and staff development regarding working with a diverse student body.

Students of all ages, interests, professions, and backgrounds are encouraged to apply for undergraduate and graduate study. Fall enrollment data from 2018 show that 28% of our student population identified as students of color, a number that has steadily increased since 2010. The majority of students at McDaniel College (65%) come from the State of Maryland, and 26% are considered first-generation college students. McDaniel College actively recruits prospective students through campus events and career fairs throughout the mid-Atlantic region.

All the students in the proposed program will complete general education courses which have been designed to educate students about different forms of diversity. Students will complete at least one multicultural course which will give students an understanding of the cultural pluralism of American society. Multicultural courses focus on the cultures and experiences of diverse groups in the United States that have been historically subordinated or marginalized and defined by such categories as race, gender, sexuality, class, religion, and disability. Students will complete at least two international courses, one of which must focus on a non-western region. International courses examine the perspectives and customs of cultures outside the U.S. or the relationship between the U.S. and world cultures. In addition to these general education course, our orientation program for first year students includes 3 sessions focused on diversity-related issues relevant to college students and those sessions span from the summer orientation through the end of the first semester so that we can address diversity education at multiple stages of their first year.

Many co-curricular, cultural activities are sponsored by the Office of Diversity and Inclusion, while other activities are initiated by our many student organizations which provide social support and co-curricular events for students. (e.g., the Black Student Union, the Gender

Sexuality Alliance, the Hispano-Latinx Alliance, the Asian Community Coalition, the Muslim Student Association, and the Jewish Student Union).

The faculty members who will teach in the proposed program participate in multiple professional development events focused on teaching and supporting students from diverse groups. Every August, McDaniel College holds a faculty development retreat and requires that faculty attend at least one session focused on diversity-related issues. Our newest full-time faculty members participate in a year-long orientation series which includes sessions about teaching our diverse student body as well. In addition, throughout the academic year, professional development sessions focused on diversity-related issues are open to all faculty and staff.

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

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

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

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

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

While we are eligible to provide Distance Education as an institution at the Graduate level, this proposed Undergraduate program will not be offered in Distance Education format.

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

While we are eligible to provide Distance Education as an institution at the Graduate level, this proposed Undergraduate program will not be offered in Distance Education format.

TABLE 1: PROGRAM RESOURCES

Resource Categories	Year 1	Year 2	Year 3	Year 4	Year 5	Narrative
1. Reallocated Funds	\$0.00	\$0.00	\$0.00	\$78,000.00	\$80,340.00	
2. Tuition/Fee Revenue (c + g below)	\$0.00	\$91,036.00	\$234,417.70	\$458,755.38	\$621,734.25	
a. Number of F/T Students	0	4	10	19	25	Because we did not market this new major when recruiting students for Fall 2019, any students who might declare this major in Year 1 will be already-enrolled students. Therefore, we are projecting no NEW students and no additional tuition revenue during Year 1 attributed to this program.
b. Annual Tuition/Fee Rate	\$0.00	\$22,759.00	\$23,441.77	\$24,145.02	\$24,869.37	
c. Total F/T Revenue (a x b)	\$0.00	\$91,036.00	\$234,417.70	\$458,755.38	\$621,734.25	
d. Number of P/T Students	0	0	0	0	0	We have so few part-time undergraduates that we are not including part-time students in our projected enrollments.
e. Credit Hour Rate	0	0	0	0	0	
f. Annual Credit Hour Rate	\$1,391.89	\$1,433.07	\$1,476.07	\$1,520.35	\$1,565.96	
g. Total P/T Revenue (d x e x f)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
3. Grants, Contracts & Other External Sources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
4. Other Sources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
TOTAL (Add 1 – 4)	\$0.00	\$91,036.00	\$234,417.70	\$536,755.38	\$702,074.25	

TABLE 2: PROGRAM EXPENDITURES:						
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5	Narrative
1. Faculty (b + c below)	\$0.00	\$0.00	\$0.00	\$78,000.00	\$80,340.00	
a. Number of FTE	6	6	6	7	7	Projected new students: Y2 = 4 students, Y3 = 10, Y4 = 19, Y5 = 25, add new faculty for every 15 new students.
b. Total Salary	\$0.00	\$0.00	\$0.00	\$60,000.00	\$61,800.00	Assumes 3% annual increase
c. Total Benefits	\$0.00	\$0.00	\$0.00	\$18,000.00	\$18,540.00	Assumes 3% annual increase
2. Admin. Staff (b + c below)	0	0	0	0	0	
a. Number of FTE	0	0	0	0	0	We do not need to hire new administrative staff because the department within which this major will be offered has sufficient staffing.
b. Total Salary	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
c. Total Benefits	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
3. Support Staff (b + c below)	\$0.00	\$0.00	\$0.00	\$0.00	\$41,100.00	
a. Number of FTE	1	1	1	1	2	We currently have 1 support staff for labs and will add 1 in Year 5.
b. Total Salary	\$0.00	\$0.00	\$0.00	\$0.00	\$30,000.00	
c. Total Benefits	\$0.00	\$0.00	\$0.00	\$0.00	\$11,100.00	
4. Technical Support and Equipment	\$0.00	\$0.00	\$0.00	\$2,500.00	\$0.00	Computer for new faculty member. All other technical support and equipment will be covered by existing resources in the Chemistry Department.
5. Library	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	The necessary resources are already available through existing databases.
6. New or Renovated Space	\$0	\$0	\$0	\$0	\$0	
7. Other Expenses	\$0.00	\$3,976.00	\$9,940.00	\$18,886.00	\$24,850.00	Current Chemistry department operating budget = \$63,587, 50% for majors (vs. 50% gen ed) = \$31,794. Divided by 32 majors = \$994 cost per student X new student projections.
TOTAL (Add 1 – 7)	\$0.00	\$3,976.00	\$9,940.00	\$99,386.00	\$146,290.00	