

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

Department Proposing Program	Biology and Chemistry		
Degree Level and Degree Type	Undergraduate, Bachelor of Arts		
Title of Proposed Program	Biomedical Science		
Total Number of Credits	128		
Suggested Codes	HEGIS:	CIP: 26.0102	
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: <a href="http://catalog.mcdaniel.edu">http://catalog.mcdaniel.edu</a>		
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:	<span style="float: right;">Date: 08/20/2019</span>	
	Date of Approval/Endorsement by Governing Board:	05/11/2019	

Revised 12/2018

# Biomedical Science 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 Biomedical Science major proposed in this document is an interdisciplinary major that will encompass many of the core classes required for students in the medical field (e.g. pre-med/DO, pre-dental, pre-vet). This major will be recognizable enough to attract the growing number of students in all of the health care fields listed above and have an interdisciplinary core that provides the foundation for each of these fields allowing students to obtain the knowledge necessary for standardized exams to gain admission and succeed in the respective secondary school and beyond.

Over the past year, our institution engaged in a year-long process of program prioritization which included the development of new majors to meet the professional needs and interests of our current and prospective students. Based on this data driven process, it was determined that our student population would benefit from having both a Biomedical Sciences major and a Health Sciences major. The Biomedical Sciences major is intended to meet the needs of pre-medical, pre-dental, and pre-veterinary students, whereas the Health Sciences major is intended to meet the needs of various allied health professions such as physician assistants, physical therapists, nurses, occupational therapists, chiropractors, pharmacists, and athletic trainers. The requirements for entry into pre-medical, pre-dental, and pre-veterinary programs are far more standardized than and quite different from the requirements for graduate programs in allied health. For example, in the former, there is a uniform requirement for two years of Chemistry (general and organic) and course work in biochemistry and physics. While our proposed Biomedical Sciences major covers that standardized coursework, our proposed Health Sciences major includes multiple specialized tracks within the major such that students can meet the widely varying course requirements for the different graduate programs within the field of allied health. Therefore, it is our hope that having both of these new majors will prepare our graduates for successful entry into the career of their choice.

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 21<sup>st</sup> century careers while receiving a liberal arts education. National trends clearly demonstrate an increase in interest in the health sciences. 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. Health Services/Allied Health/Health Sciences was in the top twenty programs for growth in this analysis, with an upward trend of +89% over the past 5 years. Consequently, we have noticed that many of the trends that would be predicted from this data have occurred in both the Biology and Chemistry departments over this time period. Both departments teach, mentor, and advise pre-medical students but we believe there are two major issues which have historically made McDaniel College less appealing to pre-med applicants. First of all, prospective students are often confused and disappointed that we do not offer a defined pre-med track or major and are thus concerned that they will not be competitive for medical school. Secondly, current pre-med students are often frustrated by juggling a Biology or Chemistry major and the pre-med course requirements, which often compete for class schedule and studying time. The proposal to create a Biomedical Science major immediately addresses the first concern and provides a mechanism to address the second; this major is structured such that it encompasses as many medical school requirements as possible given that different schools have slightly different requirements. Indeed, students interested in dental, veterinary, or osteopathy programs would also be able to take advantage of the structure in the Biomedical Science major. As a result of a recent year-long program prioritization process, McDaniel College has made the strategic decision to attract, nurture, and support the growing number of students interested in the medical/health sciences and this proposed major is a critical step in that direction. The Board of trustees has deemed the Biomedical Sciences major to be a high priority for our institution.

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 Biology & Chemistry Departments. 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

The proposed Biomedical Sciences major outlined in this document will provide the foundation and framework for students who are committed to becoming the future doctors of the world. The justification for advancement in this field is to *treat and potentially cure many of the diseases and conditions that affect humans*. This program of study not only demands the advancement of knowledge in the physical and biological sciences, but also in the psychological and sociological sciences to better treat the human condition from a holistic approach.

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

One of the largest societal needs in the next decade in the United States is *new physicians and doctors*. The Washinton Post recently reported that there will be an estimated shortage of 90,000 doctors by 2025 (Lenny Bernstein, March 3, 2015, Washinton Post). This article also highlights the need for better patient/doctor relationships. The proposed major can address both of these issues by providing the framework and knowledge for our students to gain admission and succeed in medical/health programs, but also enter the workforce as more well-rounded and socially adept physicians.

The importance of extensive preparation for the highly competitive medical school application process 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 Association of American Medical Colleges, between 1978 and 2008, 88 percent of graduates of U.S. medical schools were white or Asian. Blacks, American Indians and Hispanics together made up the remaining 12 percent. The diversity of McDaniel's undergraduate population and the comprehensive and significant support this program will provide to students will contribute to efforts to diversify the medical profession.

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 medical profession. But the education is not enough. 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. Our students are eligible to complete internships at the University of Maryland Medical Center during our January Term. Additionally, McDaniel's strong relationship with the Carroll Hospital Center will provide opportunities for direct relationship development and career exploration.

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

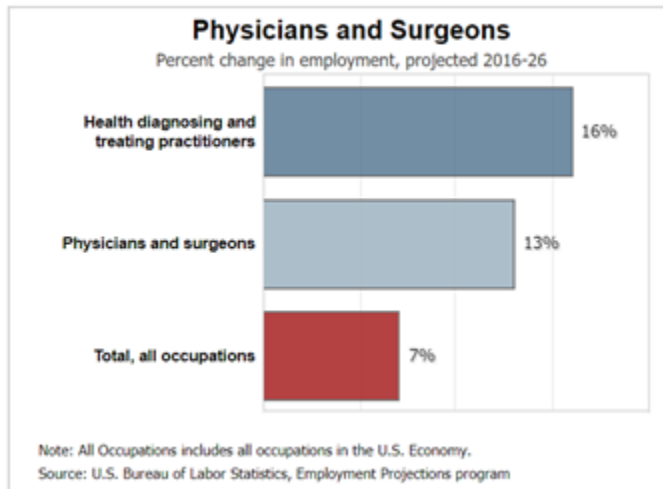
1. Describe potential industry or industries, employment opportunities, and expected level of entry (ex: mid-level management) for graduates of the proposed program.

According to Department of Labor statistics, many physicians and surgeons "work in physicians' offices. Others work in hospitals, in academia, or for the government. Increasingly, physicians are working in group practices, healthcare organizations, or hospitals, where they share a large number of patients with other doctors."

Graduates of the McDaniel program will have strong core science knowledge with research experience and will have met the pre-requisite requirements for most medical graduate programs, making them well-prepared to apply to medical school. We would not expect graduates of this program to enter the workforce until the completion of their post-Bachelor's programs, and will evaluate success based on their preparation and acceptance to graduate school, especially medical school.

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 physicians is projected to grow 16 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 Physicians and Surgeons, all other, in the state of Maryland is 1.69. Maryland is also among the top five states for the concentration of jobs and location quotients in this occupation.

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)
<a href="#">New York</a>	44,830	4.78	1.78	\$82.24	\$171,060
<a href="#">Rhode Island</a>	2,290	4.75	1.77	\$100.76	\$209,580
<a href="#">Massachusetts</a>	16,530	4.63	1.72	\$99.99	\$207,990
<a href="#">Maryland</a>	12,170	4.53	1.69	\$94.33	\$196,210
<a href="#">Connecticut</a>	6,970	4.20	1.56	\$106.67	\$221,870

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 91,400 positions.

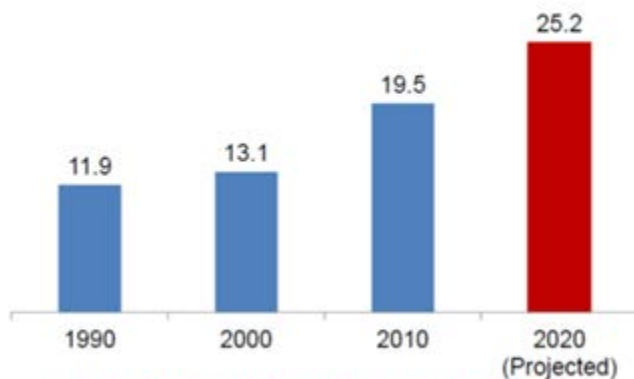
## Summary

Quick Facts: Physicians and Surgeons	
2018 Median Pay ?	This wage is equal to or greater than \$208,000 per year or \$100.00 per hour.
Typical Entry-Level Education ?	Doctoral or professional degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	Internship/residency
Number of Jobs, 2016 ?	713,800
Job Outlook, 2016-26 ?	13% (Faster than average)
Employment Change, 2016-26 ?	91,400

Additionally, the impact of the aging workforce will be felt in the medical 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 strong interest in medical school. 9.6% of the deposited students for the Fall 2019 class (59 total students) express an intent to pursue medical, veterinary or dental school. This does not include students who express interest in the allied health professions which reflects the fact that these are students highly likely to have interest in the comprehensive preparation this program provides. 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 medical school nationally (see section D.2 below), we project annual enrollment of no fewer than 10 students per year. Applying standard attrition patterns, we project a minimum of 7 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](https://mhec.state.md.us/institutions_training/Pages/searchmajor.aspx), no Maryland schools offer similar undergraduate majors at the Bachelor's level. Search terms included "biomedical", "medical", and "bio"; and ultimately a CIP code search of both the 51 and 26 categories. The most similar program we could find would be Human Biology (BA/MD) at Johns Hopkins University. However, per the degree trend data downloadable from the MHEC website ([http://data.mhec.state.md.us/Trend\\_Aux/DTRENDS18.zip](http://data.mhec.state.md.us/Trend_Aux/DTRENDS18.zip)), no bachelor's degrees have been awarded in this program since 2005.

Perhaps the most similar program in our area is the pre-health advising program offered by Johns Hopkins University, the unquestioned leader in preparing undergraduates for medical school, <https://krieger.jhu.edu/fields/pre-med>. The JHU program offers pre-health advising from the moment the student enters the college, similar to what McDaniel will do. They also list recommended pre-med courses in each discipline, many of which are similar to those in our Biomedical Science major. Because our pre-medical students will have an interdisciplinary Biomedical Sciences major, the structure of their major requirements will support their professional goals beyond the pre-med advising which they will also receive.

2. Provide justification for the proposed program.

While many colleges in our area have curricular offerings that can prepare students for admission to medical/dental/vet school, they do not have the organization and framework that our Biomedical Sciences major provides. The primary justification for this major is the fact that there is a tremendous need for doctors over the next decade and yet there are so few undergraduate programs of study that are organized in such a way to adequately prepare students for the rigors of medical school.

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, 159,302 indicated an intended major in "Biological and Biomedical Sciences." When adding an intended major of Health Professions and Related Clinical Sciences, that number increases significantly to 227,518. 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 Pre-medical Studies Committee was recently established on campus consisting of franchised faculty from the Biology, Chemistry, and Physics departments. Faculty regularly advising students desiring careers in the medical sciences reviewed institutional data and discussed strengths, weaknesses, opportunities, and threats. Consequently, the proposed Biomedical Sciences major was established. This major is interdisciplinary and draws from several departments across McDaniel College to organize a group of courses required or suggested for admission into Medical School, Osteopathy Programs, Veterinary School, and Dental School. The addition of this major enables greater structure and more consistent support and career advising throughout a student's time at McDaniel. The Biomedical Sciences program will be overseen by this advisory committee not only for the curricular demands but also to ensure that our students obtain all the extracurricular requirements such as internships, research experiences, hospital experiences, development of soft skills etc.

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

Upon completion of the Biomedical Sciences major, students will:

- a. Demonstrate foundational knowledge in biology, chemistry, physics, and psychology,
- b. Understand and apply mathematical methods and error analysis at levels appropriate to various types of medical data.
- c. Apply the scientific process, tools, and techniques to solve problems.
- d. 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.
- e. Demonstrate professional skills and behaviors consistent with careers in the medical sciences.
- f. Understand the role of ethics, diversity, and globalism in medicine and biomedical 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 Biomedical Science Major**

<b>Number</b>	<b>Title</b>	<b>Credits</b>
BIO 1111	Principles of Biology	4
BIO 1117	Topics in Biology	4
CHE 1103	General Chemistry I Structure and Bonding	4
CHE 1104	General Chemistry II Chemical Reactivity	4
CHE 2217	Organic Chemistry I	4
CHE 2218	Organic Chemistry II	4
CHE 3321	Biochemistry I	4
CHE 3322	Biochemistry II	4
STA 2215	Introduction to Statistics	4
BIO 3316	Animal Physiology	4
BIO 2203	Genetics	4
PSY 1106	Introduction to Psychology	4
SOC 1104	Introduction to Sociology	4
Any second ENG course that is a textual analysis (TA) course		4
Either: PHY 1104 Introductory Physics I PHY 1105 Introductory Physics II Or PHY 1101 General Physics I PHY 1102 General Physics II		8
Students will be required to take two biology courses from the recommended list below and one of the two must be a 3000- level biology course (either Cell Biology or Genomics). This 3000-level course and the 3000 level Animal Physiology course required above along with the capstone course would constitute a distributed Writing in the Disciplines program identical to what is currently in place for the Biology major.		

BIO 2208 Molecular Biology BIO 3310 Cell Biology BIO 3312 Genomics BIO 2202 Comparative Anatomy of Vertebrate BIO 2212 Microbiology BIO 2207 Evolution	8
Students would also then be required to take the capstone requirement in either Biology or Chemistry.  BIO 4493 Senior Colloquium (for Biology) CHE 4493 Chemistry Seminar (for Chemistry)	4
<b>Total # of credits:</b>	76

#### 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 will meet this general education requirement by taking multiple writing-intensive courses 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 <sup>nd</sup> semester level.	8
Multicultural	Category of courses for general education requirement	4
International Nonwestern	Majors will take SOC 1104 to complete this general education requirement	Credits included in the major
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 Lab	Majors will take BIO 1111 to complete this general education requirement	Credits 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	Majors will take an English course with the textual analysis designation to complete this general education requirement	Credits included in the major

Creative Expression	Category of courses for general education requirement	4
Social, Cultural, Historical Understanding	Majors will take PSY 1106 to complete this general education requirement	Credits included in the major
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
<b>Total number of general education credits outside of the major</b>		<b>31-36</b>
<b>Remaining elective courses</b> (these could count toward a minor, another major, and/or elective credit)		<b>16-21</b>
<b>Combined credits from general education and elective coursework</b>		<b>52</b>
<b>Total number of credits from the major (see previous table)</b>		<b>76</b>
<b>Total number of credits required for the B.A. degree</b>		<b>128</b>

### **COURSE DESCRIPTIONS FOR THE MAJOR:**

#### **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.*

**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*

### **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.*

### **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*

### **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.

Not open to students who have completed Mathematics 3324.

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

**McDaniel Plan:** *Quantitative Reasoning*

### **BIO 3316 - Animal Physiology**

*Credits: 4*

A study and analysis of functional processes in animals and the involvement of these processes in homeostatic regulation. Topics include osmotic and ionic regulation, excretion, respiration, circulation, muscles, nervous communication, and hormones.

This course is designed for students majoring in Biology. Course includes laboratory.

*Prerequisites BIO-1111, BIO-1117 and CHE-1102*

### **BIO 2203 - Genetics**

*Credits: 4*

A study of the concepts of classical and contemporary genetics. The action of genetic mechanisms at various levels of biological organization (molecular, cellular, organismal, and population) and in a variety of cells and organisms is included. Course includes laboratory.

*Prerequisites BIO 1111 and BIO 1117*

*Co-requisite BIO 2003*

### **PSY 1106 - Introduction to Psychology**

*Credits: 4*

An introductory course designed to develop an understanding of the basic principles governing behavior, with emphasis on the scientific method of studying behavior. Intelligence, motivation, emotion, perception, learning, personality, workplace issues, and social factors that influence the individual will be considered.

*McDaniel Plan: Social, Cultural, and Historical Understanding*

### **SOC 1104 - Introduction to Sociology: A Global Perspective**

*Credits: 4*

This course offers an overview of the discipline of sociology from a global perspective, focusing particularly on cross-cultural examples of social, economic and political relationships. It explores how social forces impact the structure of society and its social institutions as well as cultural patterns, groups, personality, and human interactions.

*McDaniel Plan: International Nonwestern; Social, Cultural, and Historical Understanding*

### **PHY 1101 - General Physics I**

*Credits: 4*

This course is the first in the two-semester, introductory, calculus-based General Physics sequence. The course will introduce students to the fundamental ideas that govern kinematics and dynamic motion for both linear and rotational systems, concepts of energy and momentum, simple harmonic motion, wave phenomena and sound, and fluid statics and dynamics. The laboratory component of the course is aimed at developing data collection and analysis skills through a series of experiments in mechanics and must be enrolled in separately.

*Co-requisite PHY 1001 General Physics I Lab*

*MAT 1117 or permission of the instructor.*

*McDaniel Plan: Scientific Inquiry with Laboratory.*



**PHY 1102 - General Physics II***Credits: 4*

This is the second course in the two-semester, introductory, calculus-based General Physics sequence. In this course we cover the fundamental ideas of electricity and magnetism, the influence of electromagnetic fields on particles, Maxwell's equations, circuits and circuit analysis, geometric and physical optics, and Einstein's theory of relativity. The laboratory component of the course is aimed at developing data collection and analysis skills through a series of experiments in electromagnetism and optics and must be enrolled in separately.

*Co-requisite PHY 1001 General Physics II Lab**MAT 1117 or permission of the instructor**McDaniel Plan: Scientific Inquiry with Laboratory.***PHY 1104 - Introductory Physics I***Credits: 4*

This is the first course in the two-semester, algebra-based, introductory physics sequence. Topics include: The fundamental ideas that govern kinematics and dynamic motion for both linear and rotational systems, equilibrium and elasticity, concepts of energy and momentum, and thermodynamics and fluids. The laboratory component of the course is aimed at developing data collection and analysis skills through a series of experiments in mechanics and thermodynamics. The laboratory must be enrolled in separately.

*Prerequisites/co-requisites MAT-1107**Co-requisites PHY-1004**McDaniel Plan: Scientific Inquiry with Lab***PHY 1105 - Introductory Physics II***Credits: 4*

This is the second course in the two-semester, algebra-based introductory physics sequence. Topics include: Oscillatory systems, waves, and sound; properties of light, geometrical optics, and physical optics; fundamental ideas of electricity and magnetism; and circuits and circuit analysis. The laboratory component of the course is aimed at developing data collection and analysis skills through a series of experiments in oscillations, light, electromagnetism, and circuits. The laboratory must be enrolled in separately.

*Prerequisites PHY-1104 or PHY-1114**Prerequisites/co-requisites MAT-1107**Co-requisites PHY-1005**McDaniel Plan: Scientific Inquiry with Lab***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***BIO 3310 - Cell Biology***Credits: 4*

A study of the structure and internal processes of eukaryotic cells. Includes cell energetics, the working of internal compartments (e.g. endoplasmic reticulum and mitochondria), and membrane transport. The interface between cells and their environment and factors allowing cooperative behavior of cells are also examined. Course includes laboratory.

*Prerequisites* BIO-1111, BIO-1117 and CHE-1102 or CHE-1104

### **BIO 3312 - Genomics**

*Credits: 4*

A study of genes and their functions on a global scale, through analysis of the entire genetic blueprint of an organism. Areas of emphasis include: comparative genomics, evolution of genomes, bioinformatics, and proteomics. This course includes a laboratory component. Biology major Group I course.

*Prerequisites/Co-requisites* Biology 2208 or 2203

**McDaniel Plan:** *Scientific Inquiry with Laboratory*

### **BIO 2202 - Comparative Anatomy of Vertebrates**

*Credits: 4*

A study of vertebrate structure in relation to phylogeny, ontogeny, and function, emphasizing morphological adaptation for function. The laboratory investigation compares the detailed anatomy of a fish (shark), an amphibian (Necturus), and a mammal (cat). Course includes laboratory.

*Prerequisites* BIO-1111 and BIO-1117

### **BIO 2212 - Microbiology**

*Credits: 4*

A study of structure, metabolism, growth, and reproduction of microorganisms with emphasis on bacteria. Course includes laboratory.

*Prerequisites* BIO-1111, BIO-1117 and CHE-1101, CHE-1103, or FYS-1137

### **BIO 2207 - Evolution**

*Credits: 4*

The evidence, the mode, and the implications of organic evolution treated in such a manner as to emphasize the function of evolution as the greatest general unifying principle in biology. Special attention is paid to the many recent contributions of research to this field.

*Prerequisites* BIO-1111 and BIO-1117

### **CHE 3301 - Medicinal Chemistry**

*Credits: 4*

This course focuses on the fundamental aspects and current methodologies involved in the drug discovery process. The fundamental aspects include the physical, chemical and pharmaceutical properties of drugs and their mechanism of action. The methodologies include lead discovery strategies, statistically based QSAR optimization methods, structure-based and mechanism-based design methods, and combinatorial techniques. Categories of drugs and the application to the chemotherapy of cancer, viral and microbial diseases will be examined.

*Prerequisites* Chemistry 2218 required, Chemistry 3321 recommended

**McDaniel Plan:** *Scientific Inquiry*

**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.*

**BIO 4493 - Senior Colloquium***Credits: 4*

This course is the capstone experience for the Biology major. Students will conduct either original or literature-based research under faculty supervision. Students will present both a senior thesis and a scientific poster. Attendance at department research seminars and seminars by candidates for honors in Biology is required.

**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*

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

Of the 76 credits proposed for the Biomedical Sciences major, 24 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 Social, Cultural, & Historical Understanding requirement: Introduction to Psychology (PSY 1106, 4 credits) or Introduction to Sociology (SOC 1104, 4 credits);
- c) 1 course will fulfill the Quantitative Reasoning requirement: Introduction to Statistics (STA 2215, 4 credits);
- d) 1 course will fulfill the Textual Analysis requirement: Choice of 1 English course with the Textual Analysis designation (4 credits).
- e) 1 course will fulfill the International Non-Western requirement: Introduction to Sociology (SOC 1104, 4 credits)

Students will meet 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.

## **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 Biomedical Sciences 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.

<b>Name</b>	<b>Terminal Degree Title and Field</b>	<b>Academic Title/Rank</b>	<b>Status</b>	<b>Courses Taught in Health Sciences major</b>
<b>Ferraris, Dana</b>	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, CHE4493: Chemistry Seminar
<b>Homan, Stephanie</b>	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
<b>Polen, Michael</b>	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
<b>Craig, Peter</b>	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, CHE4493: Chemistry Seminar
<b>Nilsson, Melanie</b>	Ph.D., Chemistry	Associate Professor of Chemistry	Full-time faculty	CHE4493: Chemistry Seminar, CHE 3321: Biochemistry I, CHE 3021: Biochemistry Lab, CHE3322: Biochemistry II, CHE3022: Biochemistry II Lab
<b>Huang, Cheng</b>	Ph.D., Molecular Genetics	Associate Professor of Biology	Full-time faculty	BIO 1111: Principles of Biology, BIO1117: Topics in Biology, BIO 2203: Genetics, BIO2208: Molecular Biology, BIO4493: Biology Senior Colloquium
<b>Parrish, Susan</b>	Ph.D., Molecular Biology	Associate Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO2208: Molecular Biology, BIO3312: Genomics BIO4493: Biology Senior Colloquium
<b>Morrison, Randall</b>	Ph.D. Biology	Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO1117: Topics in Biology, BIO2207: Evolution, BIO3310: Cell Biology, BIO4493: Biology Senior Colloquium
<b>Staab, Katie</b>	Ph.D. Biology	Associate Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO1117: Topics in Biology, BIO3316: Animal Physiology, BIO2202: Comparative Anatomy BIO4493: Biology Senior Colloquium
<b>Martinson, Holly</b>	Ph.D. Biology	Assistant Professor of Biology	Full-time faculty	BIO1111: Principles of Biology, BIO1117: Topics in Biology BIO4493: Biology Senior Colloquium
<b>Kerwin, Allison</b>	Ph.D., Molecular and	Assistant Professor of	Full-time faculty	BIO1111: Principles of

	Cell Biology	Biology		Biology, BIO 2212: Microbiology BIO4493: Biology Senior Colloquium
<b>Burley, Heather</b>	Ph.D., Animal Science	Lecturer	Part-time faculty	BIO 1101: Principles of Biology Lab, BIO 1117: Topics in Biology, BIO 2003: Genetics Lab
<b>Mehboudi, Mehrshad</b>	Ph.D., Microelectronics- Photonics	Assistant Professor of Engineering and Physics	Full-time faculty	PHY 1004: Introductory Physics I Lab, PHY 1104: Introductory Physics I, PHY 1xxx Introductory Physics II, PHY 1xxx Introductory Physics II Lab
<b>Mian, Apollo</b>	Ph.D., Physics	Professor of Physics	Full-time faculty	PHY 1014: General Physics Lab, PHY 1114: General Physics I, PHY 1102: General Physics II
<b>Chalk, Holly</b>	Ph.D., Counseling Psychology	Associate Professor of Psychology	Full-time faculty	PSY 1106: Introduction to Psychology
<b>Lemke, Debra</b>	Ph.D., Sociological Theory	Professor of Sociology	Full-time faculty	SOC 1104: Introduction to Sociology
<b>Seidel, Ethan</b>	Ph.D., Monetary Theory, Public Finance	Professor of Business Administration	Full-time faculty	STA 2215: Statistics

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. In addition, faculty who advise students in this program will have the opportunity to attend meetings of the National Association for Advisors of the Health Professions (NAAHP) for additional professional development and resources.

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, Physics, Sociology, 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. The Psychology Department is located in Merritt Hall and typically uses 8 offices, 6 classrooms, 7 laboratories, and 1 seminar/conference room. 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, Sociology, Physics 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:

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

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**

<b>Resource Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Narrative</b>
1. Reallocated Funds	\$0.00	\$0.00	\$0.00	\$78,000.00	\$80,340.00	
2. Tuition/Fee Revenue (c + g below)	\$0.00	\$136,554.00	\$304,743.01	\$507,045.42	\$671,472.99	
a. Number of F/T Students	0	6	13	21	27	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	\$136,554.00	\$304,743.01	\$507,045.42	\$671,472.99	
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	
<b>TOTAL (Add 1 – 4)</b>	\$0.00	\$136,554.00	\$304,743.01	\$585,045.42	\$751,812.99	

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	7	7	7	8	8	Projected new students: Y2 = 6 students, Y3 = 13, Y4 = 21, Y5 = 27, 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	\$0	\$0	\$0	\$0	
c. Total Benefits	\$0	\$0	\$0	\$0	\$0	
3. Support 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 support staff because the department within which this major will be offered has sufficient staffing.
b. Total Salary	\$0	\$0	\$0	\$0	\$0	
c. Total Benefits	\$0	\$0	\$0	\$0	\$0	
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 Biology & Chemistry Departments.
5. Library	\$0.00	\$5,701.00	\$5,929.04	\$6,166.20	\$6,412.85	Cost of adding the journal, Science. Other resources are already available through existing databases. Assumes annual 4% increase.
6. New or Renovated Space	\$0.00	\$0	\$0	\$0	\$0	
7. Other Expenses	\$0.00	\$4,434.00	\$9,607.00	\$15,519.00	\$19,953.00	Based on current operating budgets, the cost per student in Biology = \$484 and in Chemistry = \$994. Based on the proportionate contributions of each department to this major(50%/50%), the cost per student = \$739 X new student projections.
TOTAL (Add 1 – 7)	\$0.00	\$10,135.00	\$15,536.04	\$102,185.20	\$106,705.85	