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April 15, 2025

Dr. Sanjay K. Rai
Secretary of Higher Education
Maryland Higher Education Commission
217 East Redwood Street, Suite 2100
Baltimore, MD 21202

Dear Dr. Rai,

Salisbury University (SU) is requesting the Maryland Higher Education Commission's approval to add a new academic program – Bachelor of Science in Biochemistry and Molecular Biology.

SU currently offers Biochemistry as a concentration within our Chemistry degree, and we believe that by establishing a stand-alone program will give students greater flexibility to pursue interests outside their primary field of study without comprising the academic rigor expected of a STEM degree.

The complete proposal and supporting documentation for a new academic program is attached for your review.

Thank you for your consideration.

Sincerely,

Laurie Couch, Ph.D.
Provost & Senior VP of Academic Affairs

Office Use Only: PP#

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

Institution Submitting Proposal	Salisbury University

Each action below requires a separate proposal and cover sheet.

- (●) New Academic Program
- ( ) New Area of Concentration
- ( ) New Degree Level Approval
- ( ) New Stand-Alone Certificate
- ( ) Off Campus Program
- ( ) Substantial Change to a Degree Program
- ( ) Substantial Change to an Area of Concentration
- ( ) Substantial Change to a Certificate Program
- ( ) Cooperative Degree Program
- ( ) Offer Program at Regional Higher Education Center

Payment Submitted: (●) Yes ( ) No

Payment Type: (●) R*STARS # JBI23524 ( ) Check # JBI23524

Payment Amount: 850.00

Date Submitted: 4/15/25

Department Proposing Program	Chemistry Department	
Degree Level and Degree Type	Bachelor of Science	
Title of Proposed Program	B.S. Biochemistry and Molecular Biology	
Total Number of Credits	120	
Suggested Codes	HEGIS: 41400.00	CIP: 2602010.0000
Program Modality	(●) On-campus	( ) Distance Education (*fully online*)
Program Resources	(●) Using Existing Resources	( ) Requiring New Resources
Projected Implementation Date	(●) Fall ( ) Spring ( ) Summer	Year: 2025
Provide Link to Most Recent Academic Catalog	URL: http://catalog.salisbury.edu/	
Preferred Contact for this Proposal	Name: Jennifer Elllis	
	Title: Academic Portfolio & Curriculum Administrator	
	Phone: (410) 543-6020	
	Email: jeellis@salisbury.edu	
Provost/Senior Vice President on behalf Salisbury University	Type Name: Dr. Laurie Couch	
	Signature: Laurie L Couch	Date: 04/15/2025
	Date of Approval/Endorsement by Governing Board:	10/11/2024

Revised 1/2021

Overview

Salisbury University is proposing a Bachelor of Science in Biochemistry and Molecular Biology program, a joint program between our Departments of Chemistry and Biological Sciences that will support Maryland's thriving life sciences industry by producing graduates who work in pharmaceutical and biotechnology companies, forensic science positions, and research laboratories. Demand for biochemists and molecular biology graduates is strong and fast-growing, with job openings at the bachelor's level outpacing the number of graduates from such programs each year. Maryland and the mid-Atlantic region, in general, are prime locations for graduates of biochemistry/molecular biology programs to work because of our extensive life sciences industry, and starting salaries are high for positions in the field. Students graduating from biochemistry/molecular biology programs often successfully pursue graduate education, as well.

A. Centrality to Institutional Mission and Planning Priorities:

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

The Richard A. Henson School of Science and Technology at Salisbury University (SU) is excited to submit a proposal for a new **Bachelor of Science in Biochemistry and Molecular Biology (BMB)** to begin in the Fall 2025 semester.

The Biochemistry and Molecular Biology (BMB) program will prepare students to fill the gap in the biotechnical workforce of Maryland and the greater region after graduation, as well as prepare them to enter graduate programs in biochemistry, molecular biology, and other biomedical research fields.

The program requires 76 credit hours of STEM courses. The core program is divided into three phases:

I. Fundamental scientific knowledge and skills (32 credit hours) which introduces the basic concepts and skills of biology, chemistry, mathematics and physics.

II. Advanced scientific knowledge and skills (26 credit hours) which deepens students' biological, biochemical and chemical knowledge and skills.

III. Advanced biochemical and molecular knowledge and skills (18 credits) which introduces students to the many facets of biochemistry and molecular biology and the skills used to study them.

In addition to the core, students will have the opportunity to complete one of two specialized tracks: a focus in biology or a focus in chemistry. Each focus will require students to complete two additional upper-division courses in their chosen field. These unique focus pathways allow students to tailor the BMB program to their particular

skills and career interests. Our program also provides students with credit hour flexibility in which they may pursue other interests, including minors in business, communications, or the liberal arts. The flexible options afforded by this new program ensure that our students can graduate easily within four years, and they will ensure our students more broadly trained and well equipped to advance the future of biotechnology and biomedical research in Maryland and the surrounding region.

The American Society for Biochemistry and Molecular Biology (ASBMB) is the primary scientific society for biochemists and molecular biologists. They have been accrediting undergraduate biochemistry and molecular biology programs since 2013. Our new BMB B.S. program will meet all ASBMB accreditation standards. As such, students majoring in this program are eligible to take the ASBMB degree certification exam to demonstrate their proficiency in the curriculum and skills of the field.

The BMB program directly aligns with Salisbury University's mission in several important ways. For example, the program will "foster an environment where individuals prepare for career and life" and "empower our students with the knowledge, skills, and core values that contribute to active citizenship, gainful employment, and life-long learning in a democratic society and interdependent world." Further, because the program will utilize faculty mentoring and provides numerous opportunities for students to engage in undergraduate research or other high-impact activities, it also fulfills our mission by being student-centered and one in which "students learn from professional educators in small classroom settings, faculty and professional staff serve as academic advisors, and virtually every student has an opportunity to undertake research or experiential learning with a faculty mentor."

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

SU's 2020-2025 Strategic Plan

The proposed Bachelor of Science in Biochemistry and Molecular Biology directly supports two of Salisbury University's strategic goals as outlined in our strategic plan:

Strategic Goal 1: Enrich Academic Success and Student Development
Strategic Goal 3: Support Access, Affordability, and Academic Excellence

The program will be academically rigorous and offer high-impact experiential learning opportunities, a hallmark of academic excellence. Graduates will be eligible to sit for the professional certification exam at the end of the program. Indeed, in alignment with the accreditation standards set by the American Society for Biochemistry and Molecular Biology (ASBMB), the program will equip students with the knowledge and skills needed for successful careers in biochemistry, molecular biology, and related fields such as

biotechnology, reinforcing the program's commitment to high academic standards and preparing graduates for success in the global workforce.

With close student mentoring and advisement built in as part of the standard approach to instruction, the BMB program will foster academic success and student development. Additionally, the program will offer a flexible pathway to completing its requirements and ensures that students who encounter academic challenges early in their studies will have the opportunity to catch up, allowing them to complete their degree within four years without compromising the rigor of the individual courses. This flexibility enhances the student experience by accommodating various learning paces, fostering greater academic success, and promoting retention. It also increases affordability because it lowers the chances that students will need to stay for additional semesters to complete their degree.

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.)**

   This joint program represents a brand-new major within the Department of Chemistry, which currently offers a B.S. degree in Chemistry, and shares courses with the Department of Biological Sciences. The courses that will comprise this new program are currently part of the existing curriculum across the two departments, thus adding a B.S. in Molecular Biology and Biochemistry will require no new courses or faculty members. Indeed, the combined faculty and course offerings of the Department of Biological Sciences and the Department of Chemistry are sufficient to meet program requirements, and there is capacity enough in courses to add the additional students who will join the BMB program. As enrollment grows, the additional revenue generated through the program will be reflected in additional operating expenses in the departmental budget to cover the cost of supplies and student support. If the program grows significantly within the first five years, the Dean and Provost will evaluate the need for additional faculty resources, with a commitment to staffing the courses necessary to serve additional students. The only other anticipated additional cost is for the ASBMB certification exam, which students will take in their final semester. Currently, the cost of the exam is $45 per student. SU plans to cover these additional expenses through departmental operating budgets, ensuring minimal financial impact while maintaining program quality. This funding is guaranteed.

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

      Salisbury University is dedicated to providing the necessary administrative, financial, and technical support to meet the growing demand for this program. The university has established robust administrative structures to ensure the successful implementation of the new program. This is evidenced by the comprehensive

vetting and approval process, which involved the Chair of both the Departments of Biological Sciences and Chemistry, the Henson School of Science and Technology Curriculum Committee, the Dean of the Henson School, the University Undergraduate Curriculum Committee, and the Provost. These steps demonstrate the university's commitment to supporting the program's development and ongoing success.

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

We are committed to providing the necessary support to ensure that all students enrolled in the program can successfully complete their degree. If the program is discontinued, Salisbury University will implement a comprehensive teach-out plan, ensuring that each student has the opportunity to fulfill degree requirements in a timely manner. This reflects the university's dedication to student success and academic continuity.

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 establishment of a Biochemistry and Molecular Biology degree program at Salisbury University is driven by the dynamic advancements and growing significance of these fields in the modern era. Prior to the 1980s, it was uncommon for undergraduate institutions to offer biochemistry programs. Today, biochemistry and molecular biology are at the forefront of groundbreaking innovations in human health and disease treatment, pharmaceutical development, agricultural improvements, and the creation of sustainable energy solutions. For instance, breakthroughs such as the development of mRNA vaccines, personalized medicine, and targeted therapies like Herceptin are direct products of biochemists and molecular biologists. In agriculture, genetic engineering has led to more resilient and nutritious crops, while in energy, biofuels and artificial photosynthesis are paving the way for sustainable energy solutions. BMB programs are essential to train the next generation of researchers and innovators, poised to make significant contributions to Maryland and greater society as a whole.

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

Biochemists and molecular biologists serve a critical need through research, testing, public health policy development, disease prevention, and the development of pharmaceutical products that foster healthy living and longevity. The program will train students to pursue the jobs or graduate-level education that will lead to their successful employment in positions which fulfill these important functions.

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

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

The proposed Biochemistry and Molecular Biology (BMB) degree program at Salisbury University directly aligns with the goals and priorities outlined in Maryland's 2022 State Plan for Postsecondary Education, supporting the state's efforts to enhance student access, success, and innovation.

Student Access: The proposed program addresses the goal of ensuring equitable access to affordable, high-quality postsecondary education for all Maryland residents. Maryland is one of the most diverse states in the nation, and there are ongoing challenges in closing equity gaps in degree attainment, persistence, and other indicators of access and success. The new BMB program will provide greater access to an in-demand and high-impact field, especially given the scarcity of BMB degree offerings in the region. Currently, only 4 institutions in Maryland offer an undergraduate BMB program, and only two of those are public institutions. This disparity limits access, particularly for students in the region surrounding Salisbury University. By adding this program, Salisbury University fosters innovation and directly addresses gaps in access to a critical and growing field. Furthermore, the program's flexible curriculum will help to make the major more accessible to a diverse student body, increasing opportunities for students to pursue minors or other academic interests, thus enhancing their overall educational experience.

Student Success: The proposed BMB program also supports the goal of promoting student success by addressing the challenges related to timely completion of academic programs. The current system, where Chemistry majors follow a Biochemistry track within the Chemistry B.S. program requires a strict sequence of courses, leaving little room for electives and/or minors. This has led to situations where students who fall behind extend their time to graduation or abandon the program altogether. By introducing the BMB degree program majors will have increased flexibility, helping students graduate on time, which aligns with the priority of improving systems that prevent timely completion of an academic program. This also directly supports the

commitment to high-quality education by offering a program that is both rigorous and adaptable to students' individual needs.

Innovation: The BMB degree program is aligned with the goal of fostering innovation in Maryland higher education. Biochemistry and molecular biology are central to many modern innovations in healthcare, pharmaceuticals, agriculture, and sustainable energy. This program will prepare students to contribute to cutting-edge fields that have broad societal impacts. By offering a flexible, innovative curriculum designed to meet ASBMB accreditation standards, the program will ensure that students are well-prepared for careers in high-demand industries. This contributes to the state's strategic goal of driving innovation and addressing workforce needs, particularly in emerging fields such as biotechnology and molecular research.

Additionally, the BMB degree program aligns with Priority 6 of the Maryland State Plan for Postsecondary Education, which emphasizes "Improving systems that prevent timely completion of an academic program." The redesigned curriculum offers greater flexibility in course sequencing and scheduling, allowing students who face academic challenges early in their studies to remain on track for graduation. By offering more adaptable pathways, the program reduces the likelihood that students will need to extend their time to degree completion, thereby supporting both academic persistence and timely graduation.

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.**

   In Maryland, and across the country, the biotechnical workforce must be well-versed in the foundational knowledge and skills demanded by employers. Graduates of the Biochemistry & Molecular Biology (BMB) B.S. degree program will be well-prepared to join industries prevalent in the state and region, including pharmaceuticals, food and agricultural sciences, environmental science and conservation, biomedicine, clinical research, biotechnology, and forensic science. Additionally, Maryland's innovation ecosystem includes leading life science companies such as Astra Zeneca, Glaxo SmithKline, Lonza, United Therapeutics, Sonavi Labs, BD Biosciences, and many more. We are home to the FDA, NIH, and more federal laboratories than any other state. Entry-level positions at these employers include laboratory technician, scientist, research analyst, data analyst, data coordinator, and quality control analyst.

   Graduates will also have the foundational coursework and skills necessary for advanced graduate studies in biochemistry, molecular biology, and health professional programs. Such advanced degrees include PhD, Doctor of Medicine (MD), Doctor of Osteopathic Medicine (DO), Doctor of Veterinary Medicine (DVM), Doctor of Dental Medicine (DMD), Doctor of Dental Surgery (DDS), Master of Science in Physician Assistant (PA), and Doctor

of Pharmacy (PharmD). BMB majors pursuing advanced degrees are equipped to take on roles such as research associate, clinical researcher, biotechnologist, biomedical scientist, professor, or forensic scientist.

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

   Graduates of the Biochemistry & Molecular Biology degree program will benefit from a strong national job market for their skills. According to the Eduventures Research's analysis of Lightcast data, there were an estimated 35,198 biochemistry and biophysics jobs in the United States in 2025, with a decadal growth rate of 9%. This growth rate will significantly outpace the 6% projected growth rate for all occupations during the same period. Annually, more than 3,000 biochemists and biophysicists are sought. Many of these opportunities are concentrated in the mid-Atlantic region, where a large portion of our students are from and are likely to return to after graduation. Notably, the Philadelphia and Washington D.C. metropolitan areas rank 3rd and 6th, respectively, in the number of biochemists employed, and there are a growing number of BMB-related jobs locating on the Eastern Shore of Maryland, the region primarily servied by Salisbury University.

   Maryland is home to one of the nation's strongest life sciences industries, employing more than 54,000 people across a wide range of R&D, manufacturing, and laboratory jobs. Yet,our state's public and private colleges and universities do not currently supply enough graduates to meet market demand. For example, the National Center for Education Statistics (NCES) indicates that, in 2022-2023, only 134 B.S. degrees in biochemistry and zero B.S. degrees in molecular biology were conferred in Maryland. Analysis of Lightcast data for 2021-2024 indicates that there were 952 job openings for B.S. biochemists in the region. There are only four institutions in the state with B.S. degree programs in BMB, underscoring the need for additional programs in this area to bridge the gap between conferrals and job opportunities.

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.**

Employment Projections:

Biochemists and Biophysicists: According to the U.S. Bureau of Labor Statistics (BLS), employment in these roles is expected to grow by 9% from 2023 to 2033, which is much faster than the average for all occupations. This growth translates to approximately 3,200 new jobs over the decade

Molecular Biologists: The molecular biologist job market is anticipated to grow by 6% between 2022 and 2032. While this represents a slower growth rate, it still indicates a steady demand for professionals in this specialization.

Annual Job Openings: The BLS projects about 3,100 openings annually for biochemists and biophysicists and 5,400 annual openings for molecular (and cell) biologists from 2023 to 2033. These openings are expected to arise from the need to replace workers transitioning to other occupations or retiring. In the region (MD, NJ, PA, DE, VA), there are 500 projected openings for biochemists and biophysicists annually and 6,450 annual openings for molecular (and cell) biologists.

Industry Demand: The biotechnology sector in the region is thriving, with significant demand for professionals skilled in genetic engineering, drug development, and related technologies. This growth offers numerous opportunities for biochemistry and molecular biology graduates.

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

   In a market analysis completed on behalf of Salisbury University by Eduventures Research, a steady conferral growth in BMB degrees was noted between 2014 and 2023. Most recently, the analysis found that biochemistry conferrals grew by 0.6% from 2022 to 2023 while overall bachelor's degree conferrals declined by 2.6%. Graduate enrollment in aligned subfields grew 20% from 2019-2024, denoting a steady and growing demand for specific bachelor's degree programs as inputs. While there are four other institutions in the state that offer a BMB degree, only one is on Maryland's Eastern Shore and that is at a private institution (Washington College). There are no other public institution options for potential students who wish to stay on the Eastern Shore.

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.**

   Under the proposed CIP Code: 26.0210 (BioChemistry/BioPhysics and Molecular Biology) the following institutions have been identified as having similar programs: Goucher College, Towson University, University of Maryland, Baltimore County, and Washington College. While the programs may be similar, we believe there are several key differences that make our offering unique namely 1) it serves the Salisbury metro area and the southern Delmarva community, 2) we are a relatively small university that can offer considerable individualized attention to our students, 3) our Chemistry and Biology faculty are deeply engaged in undergraduate research, 4) our program's curriculum is quite flexible, and 5) our curriculum emphasizes foundational physical

science coursework that will serve students particularly well in graduate study. More detail regarding each program offering may be found below.

Perhaps more importantly, our program will foster a variety of post-graduation outcomes. Some programs in Maryland are geared toward a pathway to graduate education, whereas others are geared toward industry work exclusively. Ours will allow for both, and will allow students to emphasize training more toward Chemistry or Biology, depending on their interests.

Below you will find additional comparative information:

	Salisbury University	Goucher College	Towson University	Univ of MD, Baltimore County	Washington College
Serves the Salisbury Metro Area?	X				
Small College?	X	X			X
Significant Research Opportunities?	X			X	X
Flexible Program?	X		X		
Foundational Physical Science Coursework?	X	X		X	

Salisbury University: Targeting students who are interested in a small school environment but with significant research experiences with faculty mentors and a more flexible program. The Biochemistry and Molecular Biology program will provide a strong foundation in the natural and physical sciences while preparing students to enter the biotechnical workforce after graduation in positions such as a research associate or project coordinator. In addition, students will be well prepared to enter graduate programs in Biochemistry, Molecular Biology, Biomedical Research and related fields as well as medicine and pharmacy. The program is flexible enough to allow students to tailor their academic career to their individual career goals through either the two focus programs or through a minor while still finishing in 4 years. This program is designed to meet ASBMB accreditation.

Chemistry majors choose Salisbury University for its small class sizes and the accessibility of the professors for assistance with coursework and for mentoring and participating in research. Students note that the chemistry department encourages and supports a culture of collaboration through dedicated student spaces, a chemistry support center, and SI (supplemental instruction). They note that these and other activities create a close-knit inclusive student community that nurtures strong student-student ties.

Additionally, because of the department's size and collaborative atmosphere, undergraduate students use state of the art research instrumentation not only in research projects, but also in their upper-level laboratory courses.

Washington College: For students wanting a small-college setting. No concentration or focus programs are offered, decreasing flexibility in the curriculum. Emphasis is placed on independent research. Research opportunities and small class sizes are provided. Provides a standard biochemistry foundation, but no courses in introductory general chemistry.

Goucher College: Targets students seeking a broad foundation in biology, chemistry, math and physics. ASBMB accredited. No concentration or focus programs offered. This is a small program with 3 graduates in 2023. The program views itself as student-focused and competency-driven. The program highlights liberal arts integration, emphasizing ethical awareness and communication skills as core competencies. While lab-based skill-building is a strength, lack of flexibility and advanced research opportunities limits appeal to students aiming for highly competitive graduate programs or industries.

Towson University: Designed for career-oriented students, particularly those interested in merging biology and technology, a growing niche in biotechnology and healthcare. ASBMB accredited. Requires students to choose a concentration in either molecular biology, biochemistry or bioinformatics. Graduated 40 students in 2023. The bioinformatics concentration is a programming and data analysis focused program. Despite strong alignment with industry demands, it lacks academic, and research depth compared to other providers. The program at SU differs from Towson in two main ways: our program is at its core, a physical science degree and TU's focus is on bioinformatics. For the SU BMB program, all majors will take calculus and physics courses, while these are only required in the TU program's biochemistry track. TU's program has a greater emphasis towards training professional bioinformaticians while SU's program focuses on future biochemistry and molecular biology professionals gaining competency in basic bioinformatics. As such, it will likely appeal to a different cohort of prospective students. At its heart, the SU BMB degree builds upon a fundamental chemical foundation to explore life on the nanoscale. While the TU MBBB program has its foundation in biology and bioinformatics with an expansion towards the underlying chemical principles in its program of study. There is room and need for both in the world of higher education.

University of Maryland – Baltimore County: Appeals to students seeking hands-on experiences in a research-intensive environment. No concentration or focus programs offered. Graduated 59 students in 2023. Fosters practical lab skills and problem-solving abilities, ensuring graduates are work-ready or prepared for advanced study. The program includes recommended courses for those planning advanced graduate study. Offers a well-rounded curriculum and research opportunities. Prepares students for roles in biotechnology, while also supporting traditional pre-med students.

It is important to note that whereas there is some overlap in program courses across these various institutions, no two programs are the same. Further, the demand for graduates in these programs is greater than the number of students who are finishing the programs, thus any duplication is justified to fill the needs of our region and state.

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

The skills obtained by program graduates are needed to fulfill a societal need for public health, disease prevention, solving crimes, and the development of products that promote longevity and healthy living. The need for workers in this sector is greater than the current supply of graduates, providing justification for the development of an additional BMB program in the state.

The curricular content for the BMB program is already available at Salisbury University but as a concentration within the BS Chemistry and the BS Biology degrees. The program will engender little additional cost, but should produce a significant benefit to its graduates in the form of job opportunities or marketability for graduate education. In addition, the program improves upon the current structure of our offerings, as it will streamline students' ability to complete the requirements for the degree and claim the degree title that they cannot today, despite taking the same or similar coursework. This will increase the students' marketability for jobs and facilitate greater earnings across their lifespans. Finally, for students on Maryland's Eastern Shore who wish to remain close to home and earn their BMB degree, this program will provide an opportunity to do so in a cost-effective way.

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.**

There are no HBIs in Maryland that offer an undergraduate degree in Biochemistry and Molecular Biology. As such, while Salisbury University believes this is a high-demand program for the State of Maryland and its workforce needs, it does not believe Biochemistry and Molecular Biology is a high-demand program for HBIs specifically.

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.**

There are no HBIs in Maryland that offer an undergraduate degree in Biochemistry and Molecular Biology, or use the same CIP Code as this proposal, which suggests there is

not a clear, unique relevance of this program to the identity of our state's HBIs. At the HBI closest to Salisbury University, the University of Maryland Eastern Shore, they do have a bachelor's degree program in Biochemistry but so do eight other institutions within the State of Maryland, suggesting that even this different but related program is not particularly relevant to the institutional identify of HBIs.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR13B.02.03.10):

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

   The B.S. in Biochemistry and Molecular Biology program has been established to replace two current Biochemistry concentrations within the B.S. Chemistry program and add the critical integrated discipline of molecular biology. Transitioning from two concentrations to a single, unified degree program will enhance the curriculum's accessibility, flexibility, and marketability, while providing a more focused and integrated approach to biochemistry and molecular biology. This new program was developed through close collaboration between the Department of Biological Sciences and the Department of Chemistry.

   A comprehensive listing of course titles and descriptions can be found in Appendix A. The courses have been selected to address the identified needs of the chemistry, biology, and broader scientific communities, as outlined by ASBMB accreditors. The program's design incorporates a broad foundation of fundamental courses, complemented by specialized Biochemistry and Molecular Biology courses. By integrating these key scientific disciplines, students will develop a wide range of critical thinking, communication, and leadership skills that are applicable in today's rapidly evolving technological and interconnected world.

   The Biochemistry and Molecular Biology major will be housed within the Chemistry Department of the Henson School of Science and Technology, with overall management by the Chemistry Department's BMB Coordinator. Collaboration will occur with department chairs from related disciplines as needed, including Dr. Stephen Habay (Chemistry), Dr. Matthew Bailey (Physics), Dr. Veera Holdai (Mathematics), and Dr. Arthur Lembo (Geography and Geosciences) and Dr. Elizabeth Emmert (Biological Sciences).

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

   The proposed program will be offered on-campus. The educational objectives and learning outcomes are fully aligned with the ASBMB accreditation standards. Upon completing this program, students will:

- Gain a broad foundation in the fundamental principles across multiple STEM disciplines.
- Develop an integrated understanding of how energy is generated, stored, and regulated within biochemical and biological systems.
- Be able to connect key biochemical structures to their respective functions.
- Understand how genetic information is stored, read, translated, and manipulated within biological systems.
- Apply quantitative reasoning, calculations, and mathematical modeling to biochemical and biological systems effectively.
- Comprehend and articulate molecular-level concepts of evolution.
- Identify and explain the roles of molecular and biochemical regulation in maintaining homeostasis.
- Acquire substantial hands-on experimental experience, including designing experiments, conducting research, and interpreting results.
- Recognize and adhere to the professional code of conduct for scientists, with the ability to identify and address ethical issues.
- Demonstrate professional communication skills, including experience in written and oral presentations, as well as in writing personal statements and resumes.

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

   SU's University Analysis, Reporting and Assessment (UARA) provides official student data and facilitates the collection and presentation of data for Academic Program Reports (APR) on a seven-year cycle. These APRs formalize the assessment of student learning outcomes to drive programmatic decision-making. At the end of each academic year, the program will assess the extent to which learning outcomes are achieved by each student in the program. Modifications to classes or other adjustments may be made in response to areas where learning outcomes are not consistently achieved. In addition to regular APR, all students completing the program will be required to take the ASBMB certification exam in the senior capstone course (CHEM 419). This exam assesses student mastery of the learning goals from Section G2.

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

   See Appendix A

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

   Salisbury University provides a comprehensive General Education curriculum, which includes the following courses:

- Three SU Signature Outcomes (courses may also meet additional General Education and/or major requirements):
    - **Civic and Community Engagement (**3-4 credits)
    - **Diversity and Inclusion (**3-4 credits)
    - **Environmental Sustainability (**3-4 credits)
- First Year Seminar (4 credits)
- Communicating Through Writing (3-4 credits)
- Quantitative Analysis (3-4 credits)
- Human Expression (3-4 credits)
- Humanity in Context (3-4 credits)
- Social Configurations (3-4 credits)
- Social Issues (3-4 credits)
- Hands-on Science (4 credits)
- Solutions through Science (3-4 credits
- Personal Wellness (4 credits)
- Experiential Learning (3 credits)

Of the required courses, 20 credits are fulfilled through the major requirements.

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

   To obtain American Society for Biochemistry and Molecular Biology (ASBMB) accreditation, student must demonstrate proficiency through the ASMBM certificate exam.

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.**

   Upon approval, the program's academic requirements are clearly articulated on designated program pages that are located with the university's catalog. Each undergraduate program provides students with a suggested 4-year course of study (aka Curriculum Guide) that is easily accessible within the program page. Students will also have access to degree audits that are located in their student portal within Peoplesoft.

Additionally, students will have access to professional academic advisors who will support the student in academic support. Each course offered within the program will provide the student with a syllabus that outlines the expectations for faculty/student interaction, technical equipment requirements, and the learning management system.

In addition, approval of the program will be communicated in a timely manner to the appropriate offices on campus. Information regarding financial aid resources and cost of payments policies are clearly communicated on the Accounts Receivable & Cashiers Office and Office of Financial Aid & Scholarships' webpages.

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

   All publications, including marketing, catalog and website admissions pages are vetted by the Marketing and Communications Department at SU, which fac-checks all submissions.

H. Adequacy of Articulation (as outlined in COMAR 13B.02.03.19)

1. **If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements. More information for Articulation Agreements may be found here.**

   See Appendix B.

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.**

Department	Faculty Name	Terminal Degree	Academic Rank	Full- or Part-Time	Courses Overseen
Chemistry	Stephen Habay	Ph.D. Organic Chemistry	Professor	Full time	CHEM 121 CHEM 122 CHEM 221 CHEM 222
Chemistry	Robert Luttrell	Ph.D.	Professor	Full time	CHEM 121

		Chemistry (Chemometrics)			CHEM 122 CHEM 321 CHEM 333
Chemistry	Alison Dewald	Ph.D. Chemistry (Protein Biochemistry)	Associate Professor	Full time	CHEM 121 CHEM 122 CHEM 410 CHEM 417 CHEM 418 CHEM 419
Chemistry	Katherine Miller	Ph.D. Biomedical Research (Biochemistry and Molecular Biology)	Professor	Full time	CHEM 121 CHEM 122 CHEM 301 CHEM 410 CHEM 417 CHEM 418 CHEM 419
Chemistry	Joshua Sokoloski	Ph.D. Chemistry (Nucleic Acid Biophysics)	Associate Professor	Full time	CHEM 121 CHEM 122 CHEM 207 CHEM 410 CHEM 417 CHEM 418 CHEM 419

Chemistry	Zulma Jimenez	Ph.D. Physical Chemistry	Assistant Professor	Full time	CHEM 341
Chemistry	Jessica Heimann	Ph.D. Inorganic Chemistry	Assistant Professor	Full time	CHEM 121 CHEM 122 CHEM 306
Chemistry	Anita Brown	Ph.D. Physical Chemistry	Associate Professor	Full time	CHEM 342
Biological Sciences	Kimberly Quillin	Ph.D. Integrative Biology: Comparative Biomechanics	Professor of the Practice	Full time	BIOL 202
Biological Sciences	Philip Anderson	PhD Genetics	Associate Professor	Full Time	BIOL 302 BIOL 350 BIOL 415 BIOL 441
Biological Sciences	Guney Boso	PhD Molecular, Cellular, Developmental Biology and Genetics	Assistant Professor	Full Time	BIOL 350 BIOL 370 BIOL 415 BIOL 440 BIOL 445
Biological Sciences	Kirsten Guckes	PhD Microbiology and Immunology	Assistant Professor	Full Time	BIOL323 BIOL 415
Biological Sciences	Victor Miriel	PhD	Associate Professor	Full Time	BIOL 354 BIOL 415

		Biomedical Science Cardiovascular Physiology			BIOL 460 BIOL 470 BIOL 495
Biological Sciences	Kimberly Hunter	PhD Genetics	Professor	Full Time	BIOL 360 BIOL 415
Biological Sciences	Angela Freeman	PhD Physiology	Assistant Professor	Full Time	BIOL 408 BIOL 415
Biological Sciences	Christopher Briand	Ph.D. Plant Biology	Professor	Full time	BIOL 430
Biological Sciences	Dana Price	PhD Ecology and Evolution	Professor	Full Time	BIOL 415 BIOL 424
Biological Sciences	Jennifer Nyland	PhD Microbiology and Immunology	Associate Professor	Full Time	BIOL 201 BIOL 415 BIOL 425 BIOL 432 BIOL 465
Biological Sciences	Elizabeth Emmert	PhD Bacteriology	Professor	Full Time	BIOL 415 BIOL 433
Physics	Jeffery Emmert	Ph.D. Physics	Associate Professor	Full time	PHYS 121
Physics	Joseph Howard	Ph.D. Physics & Astronomy	Associate Professor	Full time	PHYS 221

Physics	Asif Shakur	Ph.D. Physics	Professor	Full time	PHYS 123
Physics	Matthew Bailey	Ph.D. Physics	Associate Professor	Full time	PHYS 223
Mathematical Sciences	Michael Bardzell	Ph.D. Mathematics	Professor	Full time	MATH 201
Mathematical Sciences	Melissa Stoner	Ph.D. Mathematics	Professor	Full time	MATH 198
Mathematical Sciences	Steven Hetzler	Ph.D. Mathematics	Professor	Full time	MATH 202
Medical Laboratory Sciences	Christina Camillo	Ed. D. & MLS(ASCP)^{CM} Education & Medical Laboratory Science	Associate Professor	Full time	MDTC 101

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**

The Center for the Advancement of Faculty Excellence (CAFE) supports faculty in the areas of teaching, research, professional development and personal wellness and the office of Instructional Design & Delivery (ID&D) provides professional development for effective pedagogical practices and instructional support for faculty engaged in teaching and learning of online, hybrid and traditional courses. Collaboratively, these offices provide various webinars, workshops, faculty learning communities and initiatives around andragogical and pedagogical best practices (such as Universal Design for Learning; Diversity, Equity & Inclusion; High Impact Practices; Problem-Based Learning; Open Pedagogy, Open Educational Resources, etc.). Additional opportunities are provided through the Faculty Development Committee and our Faculty Learning Communities such as the Distance Education FLC and the Scholarship

of Teaching and Learning FLC. Finally, the institution hosts two annual faculty development events – one in August and one in spring.

b) The learning management system

Instructional Design & Delivery provides support for the campus supported learning management system (Canvas) and other instructional software (such as lecture capture, audience response system) through various methods (e.g. workshops, video tips, how-to instructions).

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

While there are no plans to offer the new program through distance education, Salisbury University and the Chemistry Department are dedicated to supporting best practices in online instruction through the Soaring with Online Learning program. All current biochemistry faculty members have successfully completed this training.

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.

SU Libraries currently provides access to hundreds of periodicals and ebooks, numerous databases, and a steadily growing number of streaming videos. Students contact library staff via chat, emails, and/or phone. SU librarians and library staff answer chat questions whenever the Service Desk is open. SU Libraries' resources include extensive book, document, and periodical holdings, as well as a wide array of electronic resources and databases. The online catalog provides direct access and borrowing privileges to approximately eleven million items in the libraries of the University System of Maryland and Affiliated Institution libraries (USMAI).

Additionally, the SU Libraries currently subscribe to several large database packages that provide access to journals in biochemistry and molecular biology. These databases include the American Chemical Society Journals, SciFinder, ScienceDirect, and PubMed. These databases and others include many relevant journals such as Chem, Protein Science, Cell Metabolism, Analytical Biochemistry, Biochemistry and Molecular Biology Education, Trends in Biochemical Sciences, the Annual Review of Biochemistry, Biochemical Genetics, and Nature Methods. The Libraries also own several hundred print books and around 10,000 ebooks in subjects related to biochemistry, many of which are available through our USM-shared Ebsco Ebook Collection database.

The Libraries recently purchased 2024 test preparation books for students interested in graduate school, including study guides for the GRE, MCAT, PCAT, DAT, and OAT.

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.**

   Currently, SU can deliver the program in our existing space and with the current equipment resources. We anticipate approximately five of the current BS Chemistry majors and four of the Biological Sciences majors will transition to BS Biochemistry and Molecular Biology major in Year 1. Approximately six students will enroll in the program in its first year, eight new students in Year 2, and eight new students a year going forward, yielding a total program headcount at maturity of about 39 students, producing eight graduates per year. We anticipate maintaining an 85 % first year retention rate, aligning with our BS Chemistry program. SU is committed to upgrading facilities and equipment when the program has established its intended growth.

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

   SU an institutional electronic mailing system. All students and faculty are given an SU email to utilize for all university correspondence. The university's IT HelpDesk provides technical support to students who need assistance accessing e-mail.

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

   SU does not intend to offer this program via distance education at this time. However, SU is committed to supporting the best practices in online learning. Instructional Design & Delivery provides support for the campus supported learning management system (Canvas) and other instructional software (such as lecture capture, audience response system) through various methods (e.g. workshops, video tips, how-to instructions).

L. Adequacy of Financial Resources with Documentation (as outlined in COMAR13B.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.**

Table 1: Resources and Narrative Rationale

Resource Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	$0	$0	$0	$0	$0
2. Tuition/Fee Revenue (c + g below)	$286,416	$338,273	$392,089	$447,923	$505,834
a. Number of F/T Students	24	28	32	36	40
b. Annual Tuition/Fee Rate	$11,306	$11,532	$11,763	$11,998	$12,238
c. Total F/T Revenue (a x b)	$271,344	$322,899	$376,408	$431,929	$489,519
d. Number of P/T Students	2	2	2	2	2
e. Credit Hour Rate	$471	$480	$490	$500	$510
f. Annual Credit Hour Rate	16	16	16	16	16
g. Total P/T Revenue (d x e x f)	$15,072	$15,373	$15,681	$15,995	$16,314
3. Grants, Contracts & Other External Sources	$0	$0	$0	$0	$0
4. Other Sources	$0	$0	$0	$0	$0
TOTAL (Add 1 – 4)	$286,416	$338,273	$392,089	$447,923	$505,834

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.

Table 2: Program Expenditures

Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b + c below)	$167,281	$199,064	$237,448	$271,784	$307,398
a. Number of FTE	1.08	1.25	1.47	1.65	1.83
b. Total Salary	$125,775	$149,672	$178,533	$204,349	$231,126
c. Total Benefits	$41,506	$49,392	$58,916	$67,435	$76,272

Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
2. Admin. Staff (b + c below)	$21,613	$22,045	$22,486	$22,935	$23,394
a. Number of FTE	0.125	0.125	0.125	0.125	0.125
b. Total Salary	$16,250	$16,575	$16,907	$17,245	$17,590
c. Total Benefits	$5,363	$5,470	$5,579	$5,691	$5,805
3. Support Staff (b + c below)	$10,640	$12,662	$14,760	$16,937	$19,195
a. Number of FTE	0.16	0.19	0.21	0.24	0.27
b. Total Salary	$8,000	$9,520	$11,098	$12,734	$14,432
c. Total Benefits	$2,640	$3,142	$3,662	$4,202	$4,763
4. Technical Support and Equipment	$0	$0	$0	$0	$0
5. Library	$0	$0	$0	$0	$0
6. New or Renovated Space	$0	$0	$0	$0	$0
7. Other Expenses	$0	$0	$0	$0	$0
TOTAL (Add 1 – 7)	$199,533	$233,770	$274,694	$311,656	$349,987

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.**

Course evaluations are completed by students at the end of each semester, which are used in annual faculty evaluation as well as in the tenure and promotions procedures to assess teaching. In addition, these evaluations are used from promotion of adjunct faculty. Salisbury University faculty are evaluated every year by their department chair/directors using the online management system, Faculty Success.

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.**

Salisbury University follows an annual schedule for review of existing academic programs set by the University System of Maryland. Each new academic program is fully evaluated 5 years after the first enrollment; after that, programs are evaluated on a 7-year basis by an external reviewer as part of the Academic Program Review process. SU's University Analysis, Reporting & Assessment Office (UARA), provides a mid-point

check-in with departments to assess their readiness to complete their Academic Program Review

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.

Salisbury University (SU) welcomes all students who meet the university's admission requirements to pursue a Bachelor of Science in Biochemistry and Molecular Biology. This rigorous and dynamic program is designed to equip students with the knowledge, skills, and hands-on experience necessary to excel in the workforce and achieve their professional aspirations.

Aligned with the State of Maryland's commitment to advancing minority student achievement, SU prioritizes fostering an inclusive and diverse academic environment that promotes opportunity, equity, and a strong sense of belonging. Through targeted campus initiatives, SU is dedicated to ensuring that all students have access to the resources and support needed to thrive.

Additionally, in alignment with **Priority 6** of the 2022 Maryland State Plan for Higher Education, which emphasizes improving systems that support timely degree completion, this enhanced program structure streamlines academic pathways, significantly increasing students' ability to graduate within four years. By providing a well-structured curriculum and comprehensive academic support, SU is committed to student success and workforce readiness in the field of biochemistry and molecular biology.

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 program is not 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.**

Salisbury University meets the COMAR requirements to provide distance education as outlined in 13B.02.03.22 and 13B.02.03.29. SU is approved to offer distance education by Middle States Commission on Higher Education, In addition, SU particpates in The

National Council for State Authorization Reciprocity Agreements (NC-SARA), which established comparable national standards for interstate distance education program offerings.SU complies with the guidelines set by C-RAC.

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

   As an institution, we have committed to ensuring that all distance education offerings are designed and reviewed using the Quality Matters rubric. Quality Matters (QM) is a nationally recognized peer review process that is designed to foster faculty-centered continuous improvement of online education. Instructional Design & Delivery conducts the Soaring with Online Learning program and other professional development opportunities to support faculty in incorporating best practices in distance education

Appendix A: Course List

I. Fundamental scientific knowledge and skills: (32 credits)

CHEM 121: General Chemistry I 4 credits

Study of fundamental laws of chemistry and atomic structure emphasizing quantitative relationships.
Three hours lecture, three hours laboratory per week. Meets General Education: Hands-on-Science (HOS), Solutions Through Science (STS). Prerequisites This course assumes an understanding of high school chemistry and algebra. C or better in CHEM 100 or appropriate score on department placement exam.

CHEM 122: General Chemistry II 4 credits

Continuation of CHEM 121, including chemical equilibrium, electrochemistry and organic chemistry. Three hours lecture, three hours laboratory per week. Prerequisites C or better in CHEM 121

BIOL 201 – Introduction to Biology: Molecular and Cellular Biology 4 credits

Introduction to biological molecules, cellular anatomy and cellular function. Build fundamental understanding of molecular core concepts and skills that serve as a foundation for all more advanced coursework in biology. Emphasizes the chemistry of biology, properties of biological molecules, cellular composition, cellular function and diversity, metabolism, and genetics. One of two introductory courses (along with BIOL 202) required for biology majors. Three hours lecture, three hours laboratory per week
Meets General Education: Hands-on Science (HOS), Solutions Through Science (STS).
Recommended Prerequisites/Corequisites MATH 140 or equivalent

BIOL 202 - Introduction to Biology: Evolution and Ecology 4 credits

Provides a hands-on introduction to the study of evolution and ecology, including practice with the core concepts and skills that biologists use to study and preserve life. Explore several facets of biodiversity: its evolutionary origin, its ecological and societal importance, threats from human impacts, and solutions to preserve and restore biodiversity and ecosystem function to enable environmental sustainability. Three hours lecture, three hours laboratory per week.
Meets General Education: Hands-on-Science (HOS), Solutions Through Science (STS), Environmental Sustainability (ES). Recommended Prerequisites/Corequisites MATH 140 or equivalent

MATH 201: Calculus I 4 credits

Introduction to analytic geometry, limits, continuity, derivatives of elementary functions and applications of the derivative. Four hours per week. Meets General Education: Quantitative Analysis (QA). Prerequisites C or better in MATH 140 or equivalent. May Not Receive Credit for Both MATH 198 and MATH 201

or

MATH 198: Calculus for Biology and Medicine 4 credits

Introduction to analytic geometry, limits, continuity, derivatives of elementary functions, applications of derivatives and antiderivatives in a biological context. Four hours per week. Meets General Education: Quantitative Analysis (QA). Prerequisites C or better in MATH 140 or equivalent. May Not Receive Credit for Both MATH 198 and MATH 201

MATH 202: Calculus II 4 credits

Introduction to integrals, infinite series, applications and techniques of integration. Four hours per week. Prerequisites C or better in MATH 198 or MATH 201 or equivalent

PHYS 121: General Physics I 4 credits

Introduction to Newtonian mechanics and applications. Topics include kinematics, dynamics, gravitation, conservation laws, equilibrium and rotational motion. Not intended for physics majors. Three hours lecture, two hours laboratory per week. Meets General Education: Hands-On Science (HOS), Solutions Through Science (STS). Recommended Prerequisites College algebra

or

PHYS 221: Physics I 4 credits

Introduction to calculus-based Newtonian mechanics for students majoring in physics, engineering and chemistry. Topics include kinematics, Newton's laws, conservation laws and rotational motion. Six hours lecture/activity per week. Meets General Education: Hands-on Science (HOS), Solutions Through Science (STS). Major Pre or Corequisites MATH 201. Non-Major Pre or Corequisites MATH 198 or MATH 201

PHYS 123: General Physics II 4 credits

Continuation of general physics. Topics include basic concepts of electricity and magnetism, wave motion, optics and modern physics. Three hours lecture, two hours laboratory per week. Prerequisites PHYS 121

or

PHYS 223: Physics II 4 credits

Continuation of introductory physics. Topics include: electrostatics, current and resistance, DC and AC circuit analysis, magnetic fields, induction, electromagnetic waves and geometrical and wave optics. Six hours lecture/ activity per week. Prerequisites PHYS 221. Pre or Corequisites MATH 202.

II. Advanced scientific knowledge and skills (26 credits)

CHEM 221: Organic I 4 credits

An introduction to the structure, properties and reactivity of carbon compounds. Analysis of molecular structure, including bonding, conformation and isomerism, is applied to the mechanisms of organic chemical reactions. Emphasis is placed on problem solving and effective communication of chemical ideas. Three hours lecture, three hours laboratory per week. Prerequisites C or better in CHEM 122.

CHEM 222: Organic II 4 credits

A continued introduction to the structure, properties and reactivity of carbon compounds. A range of chemical reactions are applied to the development of synthetic methods for organic molecule construction, including functional group interconversion and carbon-carbon bond formation. Spectroscopic techniques for molecule identification also are discussed. Emphasis is placed on problem solving, effective communication and integration of chemical concepts. Three hours lecture, three hours laboratory per week. Prerequisites C or better in CHEM 221.

CHEM 207: Laboratory Safety 1 credit

Development of skills and attitudes for working with chemicals in a confident and responsible way. Emphasis on safety precautions and emergency procedures in case of a chemical accident.
One hour per week. Prerequisites CHEM 122.

or

MDTC 101 – Safety in the Biological, Chemical and Clinical Laboratory 1 credit

Review of laboratory safety. Summary of government laws and regulatory bodies and their effect on lab policy. Illustrations of proper procedures for laboratory hazards. Topics include chemicals, infectious microbes, animals, fire, electrical equipment, radiation, glassware and compressed gases. Training in the use of safety equipment, protective clothing and general first aid. One hour per week

CHEM 301: Chemistry Seminar 1 credit

Learn to search the chemical literature, to manage information, to write scientific reports, to create scientific presentations and to present findings. Gain an introduction to scientific ethics as well as professional skills such as resume writing, job searching and networking. One hour per week. Prerequisites ENGL 103 or HONR 111, CHEM 222

CHEM 321: Analytical Chemistry 4 credits

Study of the theory and applications of classical and modern analytical techniques. Includes volumetric, potentiometric, spectrophotometric and chromatographic methods. Three hours lecture, three hours laboratory per week. Prerequisites CHEM 122.

CHEM 341: Physical Chemistry I 4 credits

Comprehensive study of the fundamental concepts of physical chemistry. Four hours per week. Prerequisites CHEM 122, PHYS 121 or PHYS 221. Pre or Corequisites MATH 202.

BIOL 350: Cell Biology 4 credits

Focuses on the structure and function of eukaryotic cells. Topics covered include enzyme kinetics, membrane transport, cell signaling, intercellular protein trafficking, cellular respiration, mitosis and meiosis, the cell cycle, and cancer. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 201 or BIOL 210, and CHEM 122

CHEM 417: Biochemistry I 4 credits

Application of chemical principles to biological systems through study of the properties, analysis, functioning and relationship of proteins, carbohydrates, lipids and nucleic acids. Three hours lecture, three hours laboratory per week. Prerequisites CHEM 222.

III. Advanced biochemical/molecular knowledge and skills (18 credits)

BIOL 302: Bioinformatics I 4 credits

Computer-based course introduces biological databases. Emphasis placed on quantitative approaches to modeling and analyzing biological data. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 201 or BIOL 202 or BIOL 210. Pre or Corequisites MATH 198 or MATH 201

BIOL 370: Molecular Genetics 4 credits

Study of mechanisms of heredity emphasizing organization of the genome, mutation and regulation of gene expression. Three hours lecture, three hours laboratory per week.
Prerequisites BIOL 350
Pre or Corequisites CHEM 221

CHEM 418: Biochemistry II 3 credits

Study of the intermediary metabolism of biomolecules and the biochemistry underlying the expression of information contained in DNA in the synthesis of biomolecules. Three hours per week. Prerequisites CHEM 417.

CHEM 419: Biochemical Methods 4 credits

Lecture/laboratory-based exploration of biochemical techniques commonly used in industrial and academic laboratories. Demonstrates the relationships between the structure, interactions and functions of biomolecules and metabolic pathways. Six hours per week. Pre or Corequisites CHEM 418.

CHEM 410: Research 3 credits

Individual undergraduate research on approved subject under supervision of a member of the staff. Written report, seminar presentation required. Nine hours per week, conference with the instructor. Prerequisites Permission of department chair and either CHEM 301. May be taken twice for credit.

or

BIOL 415: Research in Biology 3 credits

Independent student research under the supervision of a faculty member. Schedule to be arranged individually. Forty-five contact hours per credit hour. Prerequisites Permission of instructor. May be repeatable and receive credit within the major for up to six credits combined of BIOL 415, BIOL 416, BIOL 417 and BIOL 420

Biology focus:

BIOL 323: Medical Microbiology 4 credits
Study of the medically important microorganisms, including methodology and techniques of identification. Two hours lecture, four hours laboratory per week. Prerequisites BIOL 211.

BIOL 354 Pathophysiology 4 credits

The study of mechanisms that contribute to altered physiology in human disease. Three hours lecture, two hours laboratory per week. Prerequisites C or better in BIOL 216 and BIOL 350. May Not Receive Credit for Both BIOL 334 and BIOL 354; BIOL 354 and HLSC 301

BIOL 360: Genetic Analysis 4 credits

Introduction to genetic analysis including Mendelian principles, population and quantitative genetics, cytogenetics and contributions to molecular biology. Satisfies Biology Department core requirements for genetics. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 201 or BIOL 202 or BIOL 210. Recommended Prerequisites MATH 155

BIOL 408: Neurobiology 4 credits

Explores the physiological and anatomical underpinnings of the vertebrate nervous system. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 215 or BIOL 350 or CHEM 417 or PSYC 301.

BIOL 424: Medical and Veterinary Entomology 4 credits

Designed for entomology, biology, veterinary and medical students. An introduction to the natural history of arthropods that directly or indirectly impact the health of humans, pets and livestock. Covers the life cycles of arthropods and parasites, vector identification, clinical signs and symptoms of disease, disease epidemiology, and approaches for the control of arthropod-borne diseases. Prerequisites BIOL 213

BIOL 425: Toxicology 3 credits

Introduction to basic principles, history and scope of modern environmental toxicology, and to the effects and to the mechanisms of toxicants. Includes applications to risk assessment, regulations and industry. May not be taken for credit if student has credit for ENVH 425. Three hours per week. Prerequisites BIOL 201 or BIOL 210, CHEM 122, junior standing

BIOL 430: Plant Physiology 4 credits

Advanced study of the physiological mechanisms utilized by plants with special reference to the higher phyla. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 212, CHEM 221.

BIOL 432: Immunology 3 credits

Study of the cellular and soluble aspects of immunology, focusing on the human immune response to pathogen and diseases of immune origin. Three hours per week. Prerequisites BIOL 350. May Not Receive Credit for Both BIOL 333 and BIOL 432

BIOL 433: Environmental Microbiology 4 credits

Study of the diversity and interactions of microorganisms in their natural environments. Emphasis on habitat and metabolic diversity, community interactions and industrial applications involving microbes. Three hours lecture, three hours laboratory per week. Meets General Education: Experiential Learning (EL) Prerequisites BIOL 211. Recommended Prerequisites BIOL 350

BIOL 440: Contemporary Genetics 4 credits

Lecture/laboratory-based exploration of biochemical techniques commonly used in industrial and academic laboratories. Six hours per week. Prerequisites BIOL 370 or permission of instructor.

BIOL 441: Bioinformatics II 3 credits

Exploration of viral, prokaryotic and eukaryotic genomes. Emphasis on computational techniques for assessing the genome and manipulating genomic data. Four hours lecture/laboratory per week. Prerequisites BIOL 302

BIOL 445: Virology 3 credits

Study of structure, replication and pathogenesis of viruses with emphasis on animal viruses and the role of viruses in our current understanding of cell and molecular biology. Three hours per week. Prerequisites BIOL 350.

BIOL 460: Biology of Cell Membranes 3 credits

Advanced course exploring the biology of bacterial, plant and animal cell membranes with an emphasis on how these important organelles allow cells and organisms to adapt to severe, inhospitable or constantly changing physical environments. Three hours per week. Prerequisites BIOL 350.

BIOL 465: Advanced Cell Biology 3 credits Advanced course exploring the biology, physiology and biochemistry of plant and animal cells. Topics include detailed examinations of organelle function, cell movement, protein turnover, cell adhesion, apoptosis, cell cycle regulation, and the cellular and molecular basis of cancer. Lectures are drawn principally from the latest primary and secondary literature. Three hours per week. Prerequisites BIOL 350. Recommended Prerequisites CHEM 417

BIOL 470: Biotechnology 3 credits

Study of applied aspects of biology with an emphasis on DNA technology. Recommended as a capstone course for biology majors in the cell and molecular biology/biotechnology track. Three hours per week. Prerequisites BIOL 370.

BIOL 495: Vascular Biology 4 credits

Familiarizes students with a broad spectrum of vascular biology topics. Discuss recent publications employing cutting edge techniques used to study the vascular system. Gain hands-on exposure to “classical” approaches used in vascular biology research labs. Lecture and lab highlight the application of vascular biology research to present-day clinical approaches used in the treatment of human diseases. Three hours lecture, three hours laboratory per week. Prerequisites BIOL 350 or BIOL 354

Chemistry focus:

CHEM 306: Inorganic Chemistry 4 credits

Study of the fundamental concepts of inorganic chemistry. Primary focus on main group descriptive inorganic chemistry, structure and bonding theory for both main group and transition metal compounds and organometallic chemistry. Three hours per week with Web enhancement. Prerequisites CHEM 222 and PHYS 123 or PHYS 223.

CHEM 333: Instrumental Analysis 3 credits

Study of the theoretical and practical aspects of modern instrumental analysis. Topics include information processing, spectroscopic, chromatographic and electrochemical methods. Three hours per week. Prerequisites CHEM 321.

CHEM 342: Physical Chemistry II 4 credits

Comprehensive study of the fundamental concept of physical chemistry. Four hours per week. Prerequisites: CHEM 122, MATH 202. Pre or Corequisites: PHYS 123 or PHYS 223.

PROGRAM ARTICULATION AGREEMENT

Between

Wor-Wic Community College and

Salisbury University

Associate of Science in STEM, Chemistry Concentration to

Bachelor of Science in Biochemistry and Molecular Biology

August 2025 through July 2030

This Program Articulation Agreement ("Agreement"), effective this 1st day of August 2025 (“Effective Date”), is by and between Wor-Wic Community College, a community college located in Salisbury, Maryland, and Salisbury University, a constituent institution of the University System of Maryland, an agency of the state of Maryland (hereinafter sometimes referred to individually as a “Party” or “Institution” and collectively as the "Parties" or "Institutions"). This Agreement sets forth the joint curricula and program requirements for the completion of the Associate of Science in STEM, Chemistry Concentration from Wor-Wic Community College and the Bachelor of Science in Biochemistry and Molecular Biology at Salisbury University.

RECITALS

Whereas, Wor-Wic Community College and Salisbury University are committed to partnering to expand the educational opportunities and collaborative academic programming of their respective institutions; and

Whereas, the Institutions are committed to providing a smooth transition for students wishing to earn an associate of arts degree and a baccalaureate degree; and

Whereas, the intent of the Institutions is to avoid duplication of curricula, where appropriate, within articulated programs of studies; and

Whereas, the Institutions agree that the educational growth of students and the economic development of the community is better served through cooperative educational planning and optimal utilization of community resources.

Therefore, this Agreement commits the Parties to full support of an articulation process to deliver coursework for students, resulting in the associate of arts degree from Wor-Wic Community College and

credit toward the Bachelor of Science in Biochemistry and Molecular Biology at Salisbury University. The Parties agree to the following:

I. ACADEMIC REQUIREMENTS

A. The Institutions agree to follow the joint program curriculum and course by course articulation delineated in Appendix 1, which is attached hereto and made a part of this Agreement.

B. Both Institutions will cooperate toward developing, disseminating, and presenting the articulated program information to students.

C. Students who have graduated from Wor-Wic Community College program must first apply to Salisbury University. Once a completed application is received, Wor-Wic Community College graduates who have completed the associate's degree program in Associate of Science in STEM, Chemistry Concentration, with a cumulative grade point average of 2.0 or higher will be granted admission to Salisbury University as an Biochemistry and Molecular Biology major.

D. All articulated course credits applied towards satisfying Bachelor of Science in Biochemistry and Molecular Biology major requirements earned with a C or better will be accepted for transfer according to the articulation matrix in Appendix 1.

E. Salisbury University shall provide a Checklist for students as a planning tool for completing coursework required for the Bachelor of Science in Biochemistry and Molecular Biology major in Appendix 2, attached hereto and made a part of this Agreement.

F. Students intending to transfer are recommended to apply for admission by the priority deadline for the semester for which they intend to enroll.

G. Students are subject to all specific policies pertaining to students admitted to the Salisbury University baccalaureate degree program in Bachelor of Science in Biochemistry and Molecular Biology and all other Salisbury University admissions policies and procedures.

II. TERM AND TERMINATION

A. The term of this Agreement commences as of the Effective Date listed herein. This Agreement is based on the present curricula contained herein and in all appendices, and is effective for five (5) years from August 2025 to July 2030.

B. Either Party may terminate this Agreement with notice to the other Party, pursuant to Section III.G below. Upon termination or expiration of this Agreement, the Parties shall develop a process that will reasonably allow students already admitted to and enrolled in joint programming to continue their studies. Neither Party will terminate this Agreement at a time that would deter a "cohort-in-progress" from completing graduation within the originally designated timeframe.

III. GENERAL PROVISIONS

A. Each Institution is responsible for the administration of its respective courses, including content, requirements, faculty, and student services (to include, but not limited to, admissions, financial aid, class registration, etc.).

B. When enrolled in a Salisbury University course, the student is subject to all policies and procedures applicable to Salisbury University students. When enrolled in a Wor-Wic Community College course, a student is subject to all policies and procedures applicable to Wor-Wic Community College students. Additional joint policies and procedures may be adopted and implemented at the discretion of both Parties.
C. The Parties recognize that course scheduling beyond the associate's degree level resides exclusively with Salisbury University and will be coordinated with Wor-Wic Community College by the designated Salisbury University representative. Where academic calendars differ, the Parties will work together to coordinate class offerings and class schedules.
D. The disclosure of information about individual students is limited by the federal Family Educational Rights and Privacy Act (FERPA). The Parties agree that release of student educational records to each other is conditioned upon the submission of a signed agreement by the student authorizing such release.
E. The Parties agree not to release student information to any third-party without the written consent of the other Party and in compliance with FERPA and any other federal or state of Maryland laws, rules, and regulations, and policies of the Parties.
F. The Parties shall publicize any joint offerings in their respective catalogs, website, and other materials as appropriate. Notwithstanding the foregoing, neither Party may use the names or marks of the other without the prior written approval of the other Party.
G. The Parties shall inform students in their respective programs of the complementary program opportunities available at each other's respective institution, support each other's marketing efforts toward the same, and encourage students to apply to programs consistent with an individual student's interests.
H. Notwithstanding anything in this Agreement to the contrary, both Parties retain full authority over their respective courses, programs, and requirements. Both Parties reserve the right to make changes to their respective courses, programs, and requirements. However, each Party shall give to the other reasonable notice and details of changes to this Agreement and other changes in its courses, programs, and requirements that may affect this Agreement. In the event such changes affect the terms of this Agreement, this Agreement and any of its appendices shall be updated as needed to reflect such changes.
I. The Parties designate the following persons as their respective representatives to coordinate and manage the activities under this Agreement:

Wor-Wic Community College
Kristin Mallory, VP for Academic Affairs
32000 Campus Drive
Salisbury, Maryland 21804
kmallory@worwic.edu
(410) 334-2813

Salisbury University
Michael Scott, Dean
Richard A. Henson School of Science and Technology

1101 Camden Avenue
Salisbury, Maryland 21801
msscott@salisbury.edu
(410) 543-6489

J. The designated representatives shall meet as needed, at a mutually agreeable time and location, to discuss various collaborations and other topics of interest to either Institution. A Party may change its representative by giving notice to the other Party.
K. Either Institution may at any time recommend changes to this Agreement. Both Institutions reserve the right to modify the programs as deemed necessary and agree to inform the appropriate representatives of the other Institution of recommended changes. This Agreement may be modified only in writing signed by both Parties.
L. All notices under this Agreement must be in writing; delivered in person, by U.S. mail or by email to the representatives listed above in this Section III.
M. Nothing in this Agreement is intended to form a joint venture between the Parties. Nothing in this MOU is intended to create rights or benefits for any person or entity other than the Parties.
N. This Agreement integrates the entire agreement of the Parties and supersedes any and all prior and/or contemporaneous agreements between the Parties, written or oral, with respect to the subject matter of this Agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives.

Wor-Wic Community College

_____
Deborah Casey, PhD
President

Date: _____

Salisbury University

_____
Laurie L. Couch, PhD
Provost and Senior Vice President of Academic Affairs

Date: _____

APPENDIX 1

Articulation Matrix

The following matrix includes course equivalencies, including general education requirements and courses necessary to satisfy major requirements. The matrix also includes a recommended student curricular pathway to complete the Associate of Science degree and the Bachelor of Science degree requirements.

While the student is not required to take all courses in the precise order recommended in the articulation matrix, all course equivalencies described in the matrix and the manner in which they fulfill general education and major requirements at Salisbury University are binding.

Students are strongly advised to seek appropriate advising with regard to the completion of requirements for the associate of science degree, transition to Salisbury University, and completion of all requirements for the Bachelor of Science in Biochemistry and Molecular Biology

APPENDIX 2

Bachelor of Science Biochemistry and Molecular Biology Curriculum

Fall 2025

This Appendix 2 outlines the requirements to earn a baccalaureate degree in Biochemistry and Molecular Biology from Salisbury University, as of the Fall 2025 semester. It includes overall Salisbury University curriculum policies, general education requirements, major core courses, and major elective courses.

WW Course Prefix	WW Course Number	WW Course Title	Credits (at WW)	GenEd at WW		SU Course Prefix	SU Course Number	SU Course Title	Credits (at SU)	GenEd at SU	SU Degree Requirements	Credits Taken by Student	
ENG	101	Fundamentals of English I	3	English Composition	Semester 1	ENGL	103	Composition and Research	3	CTW (1 of 10)			
MTH	201	Calculus I	4	Mathematics		MATH	201	Calculus I	4	QA (2 of 10)	MR (1 of 21)	15	
BIO	105	Principles of Biology I	4	Biological/Physical Science		BIOL	201	Introduction to Biology: Molecular and Cellular Biology	4	STS (3 of 10)	MR (2 of 21)		
CHM	105	General Chemistry I	4	Biological/Physical Science		CHEM	121	General Chemistry I	4	HoS (4 of 10)	MR (3 of 21)		
ENG	151	Fundamentals of English II	3	Arts and Humanities	Semester 2	ENGL	LIT	English Literature Elective	3	HE (5 of 10)			
BIO	106	Principles of Biology II	4			BIOL	202	Introduction to Biology: Evolution and Ecology	4		MR (4 of 21)	15	
MTH	202	Calculus II	4			MATH	202	Calculus II	4		MR (5 of 21)		
CHM	106	General Chemistry II	4			CHEM	122	General Chemistry II	4		MR (6 of 21)		
CHM	201	Organic Chemistry I	4		Semester 3	CHEM	221	Organic Chemistry I	4		MR (7 of 21)		
PHY	141	Physics I	4			PHYS	221	Physics I	4		MR (8 of 21)		
CHM	107	Laboratory Safety	1			CHEM	207	Laboratory Safety	1		MR (9 of 21)	15	
ECO	120	Survey of Economics	3	Social/Behavioral Science		ECON	150	Principles of Economics	3	SI (6 of 10)			
HIS	201	American History	3	Arts and Humanities		HIST	201	History of the United States	3	HiC (7 of 10)			
PHY	142	Physics II	4		Semester 4	PHYS	223	Physics II	4		MR (10 of 21)		
CHM	202	Organic Chemistry II	4			CHEM	222	Organic Chemistry II	4		MR (11 of 21)	15	
HIS	101	World Civilations I	3	Social/Behavioral Science		HIST	101	World Civilations	3	SC (8 of 10)			
ELEC		Open Elective	4			ELEC		Open Elective	4				
			60		Semester 5	BIOL	302	Bioinformatics I	4		MR (12 of 21)		
						CHEM	321	Analytic Chemistry	4		MR (13 of 21)	15	
						FTWL	106	Personal Wellness	4	PW (9 of 10)			
						CHEM	417	Biochemistry I	3		MR (14 of 21)		
					Semester 6	BIOL	350	Cell Biology	4		MR (15 of 21)		
						CHEM	418	Biochemistry II	3		MR (16 of 21)		
						CHEM	301	Chemistry Seminar	1		MR (17 of 21)	16	
						ELEC		Open Elective	4				
						ELEC		Open Elective	4				
					Semester 7	BIOL	370	Molecular Genetics	4		MR (18 of 21)		
						CHEM	341	Physical Chemistry I	4		MR (19 of 21)		
						CHEM	410	Chemical Research	3		MR (20 of 21)	15	
						ELEC		Open Elective	4				
					Semester 8	CHEM	419	Biochemical Methods	4	EL (10 of 10)	MR (21 of 21)		
						ELEC		Open Elective	4				
						ELEC		Open Elective	4			16	
						ELEC		Open Elective	4				
								CC Credits Transferred	60				
								SU Credits	62				

Wor-Wic Community College

Salisbury University

SU General Education Course Requirements (10*):
HoS - Hands-on Science
STS - Solutions Through Science
QA - Quantitative Analysis
CTW - Communicating Through Writing
HE - Human Expression
SC - Social Configurations
SI - Social Issues
FYS - First Year Seminar*
HiC - Humanity in Context
EL - Experiential Learning
PW - Personal Wellness

* FYS not required of transfer students

** Three thematic GenEd requirements must be met:
Environmental Sustainability (ES), Diversity & inclusion (DI),
Civic Engagement (CE)

MR - Major requirements (21)

Student ID:_____
Student Name:_____
Advisor Name:_____

Catalog: 2025-2026 Undergraduate & Graduate Catalog
Program: Biochemistry and Molecular Biology, B.S. Curriculum Guide

Biochemistry and Molecular Biology, B.S. Curriculum Guide

This curriculum guide is an unofficial tool for planning. Matriculated students and advisors should consult the Academic Requirements Report in GullNet before and after registering for classes each semester to track academic progress.

University Undergraduate Major Policies

- Refer to the program page for this major and the Courses section of this catalog for approved prerequisites and General Education courses.
- Program requirements may not equal 120 credit hours. Students must register for additional electives to complete 120 credits required for graduation.
- All graduates must have a minimum of 30 credits of 300/400-level courses with C grade or above; at least 15 of those credits must be taken at SU.
- Students must have a minimum cumulative GPA of 2.0 for graduation.
- Students must complete at least 30 credit hours by direct classroom instruction and/or laboratory experience.
- Students must take 30 of the last 37 credit hours at SU.
- It is the student's responsibility to satisfy graduation requirements. Please refer to the program page of this catalog for detailed major requirements.
- Students must apply online for graduation by November 15 for May and by May 15 for December.

First Year

Semester 1

Course Name	Hour(s) Credit	Term Taken	Grade
CHEM 121 - General Chemistry I	4 Hour(s) Credit		
MATH 201 - Calculus I	4 Hour(s) Credit		
GENE CTW - Communicating Through Writing	3-4 Hour(s) Credit		
GENE FYS - First Year Seminar	4 Hour(s) Credit		

Total Credits: 15-16

Semester 2

Course Name	Hour(s) Credit	Term Taken	Grade
CHEM 122 - General Chemistry II	4 Hour(s) Credit		
MATH 202 - Calculus II	4 Hour(s) Credit		
GENE HE - Human Expression	3-4 Hour(s) Credit		
GENE SC - Social Configurations	3-4 Hour(s) Credit		

Total Credits: 14-16/29-32

Winter/Summer Term

List courses that were taken during winter/summer terms:

Second Year

Semester 1

Course Name	Hour(s) Credit	Term Taken	Grade
BIOL 201 - Introduction to Biology: Molecular and Cellular Biology	4 Hour(s) Credit		
CHEM 221 - Organic Chemistry I	4 Hour(s) Credit		
PHYS 121 - General Physics I	4 Hour(s) Credit		
OR			
PHYS 221 - Physics I	4 Hour(s) Credit		
GENE HIC - Humanity In Context	3-4 Hour(s) Credit		

Total Credits: 15-16/43-48

Semester 2

Course Name	Hour(s) Credit	Term Taken	Grade
BIOL 202 - Introduction to Biology: Evolution and Ecology	4 Hour(s) Credit		
CHEM 207 - Laboratory Safety	1 Hour(s) Credit		
OR			
MDTC 101 - Safety in the Biological, Chemical and Clinical Laboratory	1 Hour(s) Credit		
CHEM 222 - Organic Chemistry II	4 Hour(s) Credit		
PHYS 123 - General Physics II	4 Hour(s) Credit		
OR			
PHYS 223 - Physics II	4 Hour(s) Credit		

Total Credits: 13/56-61

Winter/Summer Term

List courses that were taken during winter/summer terms:

Third Year

Semester 1

Course Name	Hour(s) Credit	Term Taken	Grade
BIOL 302 - Bioinformatics I	4 Hour(s) Credit		
CHEM 321 - Analytical Chemistry	4 Hour(s) Credit		
CHEM 417 - Biochemistry I	4 Hour(s) Credit		
GENE SI - Social Issues	3-4 Hour(s) Credit		

Total Credits: 15-16/71-77

Semester 2

Course Name	Hour(s) Credit	Term Taken	Grade
BIOL 350 - Cell Biology	4 Hour(s) Credit		
CHEM 301 - Chemistry Seminar	1 Hour(s) Credit		
CHEM 418 - Biochemistry II	3 Hour(s) Credit		
GENE CCE - Civic and Community Engagement	3-4 Hour(s) Credit		
GENE DI - Diversity and Inclusion	3-4 Hour(s) Credit		

Total Credits: 14-16/85-93

Winter/Summer Term

List courses that were taken during winter/summer terms:

Fourth Year

Semester 1

Course Name	Hour(s) Credit	Term Taken	Grade
BIOL 370 - Molecular Genetics	4 Hour(s) Credit		
BIOL 415 - Research in Biology	1-3 Hour(s) Credit		
OR			
CHEM 410 - Chemical Research	3 Hour(s) Credit		
CHEM 341 - Physical Chemistry I	4 Hour(s) Credit		
XXXX 001 - Elective Needed for 120 Credits	3-4 Hour(s) Credit		

Total Credits: 12-15/97-108

Semester 2

Course Name	Hour(s) Credit	Term Taken	Grade
CHEM 419 - Biochemical Methods	4 Hour(s) Credit		
GENE EL - Experiential Learning	Min. of 3 Hour(s) Credit		
OR			
XXXX 000 - Elective - If Needed for 120 Credits	3-4 Hour(s) Credit		
GENE PW - Personal Wellness	4 Hour(s) Credit		
XXXX 002 - Elective Needed for 120 Credits	3-4 Hour(s) Credit		

Total Credits: 14-16/111-124

Notes:

Outlook

Fw: Agreement for Biochemistry and Molecular Biology

From Ryan Shifler <RMSHIFLER@salisbury.edu>
Date Tue 4/29/2025 3:50 PM
To Jennifer Ellis <JEELLIS@salisbury.edu>

See below - WWCC Letter

Ryan Shifler, PhD
Associate Dean
Henson School of Science and Technology
Associate Professor
Department of Mathematical Sciences
Salisbury University
http://faculty.salisbury.edu/~rmshifler/

From: Mallory, Kristin <kmallory@worwic.edu>
Sent: Tuesday, April 29, 2025 3:14 PM
To: Ryan Shifler <RMSHIFLER@salisbury.edu>
Cc: Hall, Stacey <shall@worwic.edu>; Riley, Patricia <priley@worwic.edu>
Subject: Agreement for Biochemistry and Molecular Biology

Dear Dr. Shifler,
Please accept this email as notification that Wor-Wic Community College is interested and intends to partner with Salisbury University for the articulation of the Associate of Science in STEM Transfer, Chemistry Concentration with the Bachelor of Science in Biochemistry and Molecular Biology.
As always, we appreciate the continued partnership between our institutions.
Thank you,
Kristin

Kristin L. Mallory, Ed.D.
Vice President for Academic Affairs
Wor-Wic Community College
32000 Campus Drive
Salisbury, MD 21804
410.334.2813