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

| | |
|---|---|
| Institution Submitting Proposal | College of Soutern of Maryland |

*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 # (●) Check # 6O5423 | Payment Amount: $850.00 | Date Submitted: 1/28/25

| | |
|---|---|
| Department Proposing Program | STEM and Professional Studies |
| Degree Level and Degree Type | Associate of Science |
| Title of Proposed Program | Biology |
| Total Number of Credits | 60 |
| Suggested Codes | HEGIS: CIP: |
| Program Modality | (●) On-campus ( ) Distance Education (fully online) ( ) Both |
| Program Resources | (●) Using Existing Resources ( ) Requiring New Resources |
| Projected Implementation Date (must be 60 days from proposal submisison as per COMAR 13B 02 03 03) | (●) Fall ( ) Spring ( ) Summer Year: 2025 |
| Provide Link to Most Recent Academic Catalog | URL: https://catalog.csmd.edu/ |
| Preferred Contact for this Proposal | Name: Dr. Nicole Harrell<br>Title: Assessment and Curriculum Coordinator<br>Phone: (301) 934-7569<br>Email: nbharrell@csmd.edu |
| President/Chief Executive | Type Name: Dr. Yolanda Wilson<br>Signature: [signature] Date: 1-15-2025 |
| | Date of Approval/Endorsement by Governing Board: |

Revised 1/2021

COLLEGE OF SOUTHERN MARYLAND
CSM
1958

*Office of the President*

January 14, 2025

Dr. Sanjay Rai
Secretary of Higher Education
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Re: New Academic Degree Program: Biology, AS

Dear Dr Rai:

The College of Southern Maryland (CSM) is submitting a proposal for an Associate of Science (AS) in Biology. This degree will provide an affordable and high-quality option for part- and full-time students with a specific academic and/or professional interest in the areas of biology, botany, zoology, anatomy and physiology, microbiology, and genetics. This option introduces this discipline within the context of allied subject areas, preparing students for specific concentration at a four-year Maryland state college or university.

The program is approved by CSM's Curriculum and Instruction Committee, President's Cabinet, and the Board of Trustees. We are seeking the Commission's approval to offer this program beginning Fall 2025.

Sincerely,

Yolanda Wilson, Ed. D
President
College of Southern Maryland



Office of the President
Center for Business and Industry, Room 204
8730 Mitchell Road, PO Box 910, La Plata MD 20646-0910
301-934-7625 • www.csmd.edu

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.

This associate of science transfer option is designed for part- and full-time students with a specific academic and/or professional interest in the areas of biology, botany, zoology, anatomy and physiology, microbiology, and genetics. This option introduces this discipline within the context of allied subject areas, preparing students for specific concentration at a four-year Maryland state college or university.

The following is a sample list of occupations for which such a concentration might be appropriate: horticulturist, chiropractor, dentist, pharmacist, podiatrist, veterinarian, agricultural scientist, forester, conservation scientist, biologist, pharmacologist, oceanographer, optometrist, physician.

The College of Southern Maryland's mission statement emphasizes that the college "enhances lives and strengthens the economic vitality" of our region (https://www.csmd.edu/about/strategic-plan/index.html). The biology program contributes directly to this mission by providing students with needed high earning jobs. According to EMSI, the median hourly earnings of a biological scientist is $43.10 and for general internal medicine physicians is $134.33 per hour for the region. The U.S. News & World Report states that "few fields offer better job prospects than science, technology, engineering and math, known collectively as STEM." According to PayScale data, STEM majors procure the highest starting salaries. A Guide to STEM Majors (usnews.com). Wor-Wic Community College - Science, Technology, Engineering, Math (worwic.edu)

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

The College of Southern Maryland's Strategic Goal #1 is to improve student progress and completion. A program review of the mathematics and sciences A.S. degree was completed in 2021. The program review included a self-study and an evaluation by an external reviewer. The external reviewer was Dr. Jeffrey J. Byrd, Interim Vice President for Academic Affairs and Professor of Biology & Microbiolog,.y at St. Mary's College of Maryland. Dr. Byrd had been an external reviewer for both biology and natural sciences at other institutions, commissioner for the Middle States Commission on Higher Education, and was a member of the Transfer with Success Act Committee for MHEC. Both the self-study and external reviewer concluded that the Mathematics and Sciences degree should be split, with Biology being a stand-alone degree, rather than a concentration.

The College of Southern Maryland transfer coordinator was surveyed during the program review and her assessment was that the combined mathematics and sciences degree created such a rigid course structure that articulation agreements with transfer institutions were hindered. As a result, students pursuing biology were transferring before completing an associate degree because the program did not meet the course requirements of the transferring institution. By having biology as a stand-alone degree, the new program can be tailored to a seamless transition to 4-year institutions.

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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.

Funding will be from existing resources. No new courses result from this program; therefore, there is no need for additional resources, neither in personnel nor supplies. This program is only the separation of biology from the other mathematics and sciences disciplines into a stand-alone program.

4. Provide a description of the institution's a commitment to:
a) ongoing administrative, financial, and technical support of the proposed program
b) continuation of the program for a period of time sufficient to allow enrolled students to complete the program.

The findings of the 2021 program review were presented to the Academic Learning and Assessment Committee at the College of Southern Maryland, with attendance including the various stakeholders (Provost and Vice President of the Division of Learning, Dean of Science and Health, Dean and Associate Dean of Business and Technical Studies, and the coordinators of the affected programs). The new biology degree has since been approved by the Curriculum and Instruction Committee as well as the Board of Trustees. Thus, the college has demonstrated commitment to this degree plan and will support the program administratively, financially, and with the technical support needed to assure student success.

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

According to the Maryland Department of Labor, Licensing, and Regulation, between 2008-2018, all areas of biological science employment saw growth. All these jobs required a bachelor's degree or higher so there is growth in opportunity and educating this growing workforce is essential. [Occupational Projections - B - Maryland Occupational Projections - Division of Workforce Development and Adult Learning (state.md.us)]

| Occupation | 2008 Employment | 2018 employment | Change | Replacement job openings | Total job openings |
|---|---|---|---|---|---|
| Biochemists/biophysicists | 900 | 1275 | +380 | 290 | 665 |
| Biological science teachers, postsecondary | 830 | 935 | +105 | 145 | 250 |

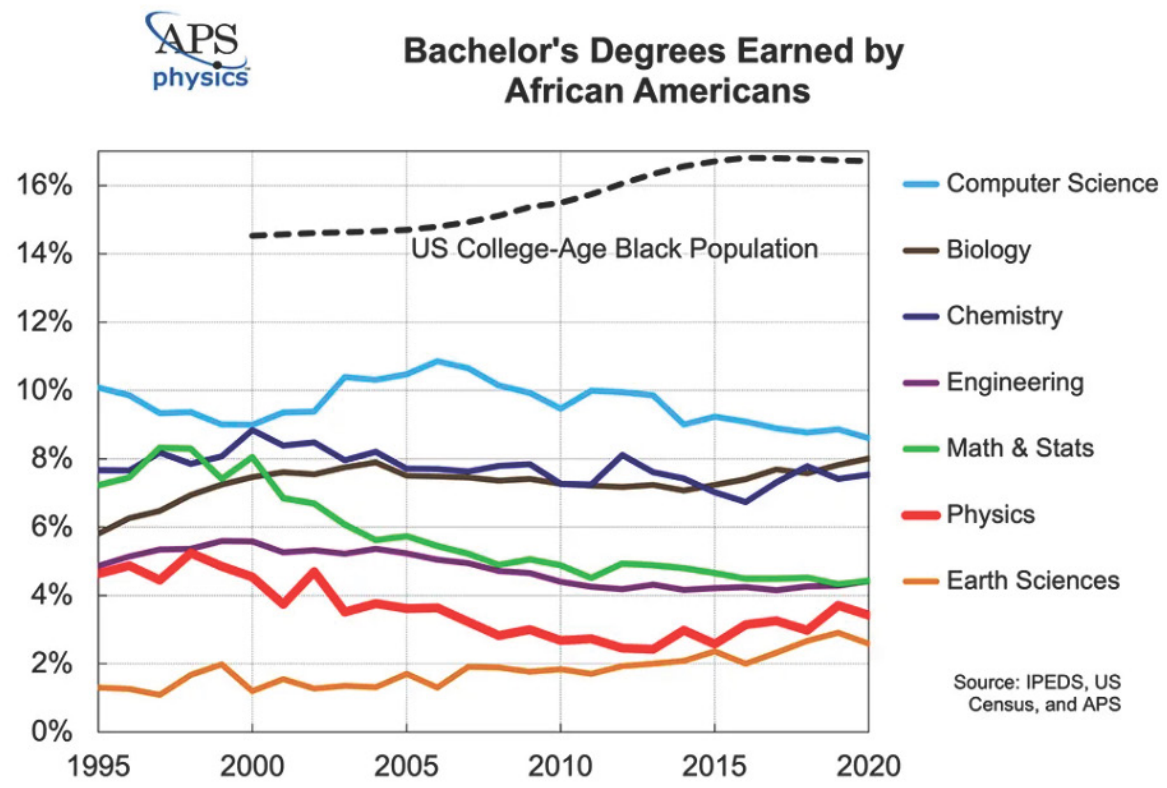
| | | | | | |
|---|---|---|---|---|---|
| Biological scientist, all other | 3020 | 3485 | +465 | 970 | 1435 |
| Biological technicians | 2745 | 3220 | +475 | 960 | 1435 |
| Biomedical engineers | 560 | 955 | +390 | 115 | 510 |

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

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

Of the 111 biology students who transferred to 4-year institutions between 2014-2022, twenty-one of the students identified as Black (This did not include students who identified as multi-racial, undeclared, or foreign). Therefore, 19% of the students identified as Black compared with the 8% of Black students who earn bachelor's degrees in the United States. While CSM does not offer the bachelor's degree, this is a transfer program intended for students pursuing a bachelor's degree. Therefore, CSM expands the opportunities of Black students. Bachelor's Degrees Earned by African Americans, by Major (aps.org)

## Bachelor's Degrees Earned by African Americans, by Major




This graph shows the percent of US bachelor's degrees awarded to Black and African American students in Science, Technology, Engineering, and Mathematics (STEM) fields, as well as the percent of college-age (18-24 years) United States permanent residents who are Black or African American. Degrees awarded to temporary residents are excluded from calculations. Data on the college age population are collected from the US Census.

Beyond just Black students, CSM offers expanded opportunities for minority students. Seventy-two of the 111 biology transfer students identified as non-White, with Asian being the second largest minority after Black. Six of the 111 students identified as Asian.

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

According to the Maryland State Plan, the second primary goal is to, "Promote and implement practices and policies that will ensure student success". Goal #2, priority #5 states, "Maintain the commitment to high-quality postsecondary education in Maryland." 2022 Maryland State Plan for Higher Education One measure of success for a program is demonstrating that students can meet the student learning outcomes for the program. Through the program review, it was determined that "course learning outcomes were developed separately from program learning outcomes".

As a result, no common assessments were found within the mathematics and sciences concentrations to meet the individual student learning outcomes. Some concentrations had no assessment for a given student learning outcome. For example, the biology concentration had no course offerings to align with outcome #6 (Demonstrate effective written and oral communication skills in technical subjects).

By separating biology from mathematics and sciences, a set of common student learning outcomes with clearly defined assessment tools can be obtained. Having clarity for program outcomes and definitive assessments to measure those outcomes will help to clearly show student success and reveal obstacles to success that need elimination.

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

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

According to Lightcast Data, in 2022, there were 319,575 jobs in STEM which is 40% above the National average. Between 2022-2027, the expected percent change is +6.7%. The median earning for STEM jobs are $49.34/hour or $102,000/year. This data shows that there is significant opportunity for employment in STEM and that the income is a livable wage. Occupations specific to biology in the Lightcast Data collection are found in the table below.

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

| Occupation | 2022 jobs | Annual openings (2022-2027) | Median earnings | Growth |
|---|---|---|---|---|
| Postsecondary teachers | 20275 | 2166 | $41.66 | 8.03% |
| Medical and health services managers | 3821 | 408 | $60.70 | 12.34% |
| Clinical laboratory technologists and technicians | 2078 | 168 | $29.48 | 5.13% |
| Biological scientists, all other | 1994 | 189 | $47.90 | 4.15% |

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.

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

Not only are STEM jobs expecting growth but jobs in our region are expecting growth. Looking at Southern Maryland and surrounding areas, the EMSI labor market demand shows 2.6% growth in jobs.

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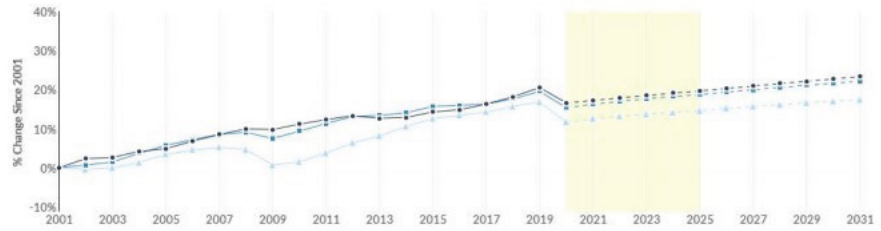
Regional Trends




| Region | 2020 Jobs | 2025 Jobs | Change | % Change |
|---|---|---|---|---|
| Region | 247,493 | 254,023 | 6,530 | 2.6% |
| State | 1,234,173 | 1,269,948 | 35,775 | 2.9% |
| Nation | 23,455,386 | 24,071,420 | 616,034 | 2.6% |

According to the Bureau of Labor Statistics, looking at the 2019 biology degree worker, 69% employed in the occupation needed at least a bachelor's degree, 59% of those employed in the field needed an advanced degree. The top 5 fields in decreasing order of employment in biology are the following: healthcare, management, life/physical/social science, education/library, business &finance. All the top fields of employment required at least a bachelor's degree. Field of degree: Biology : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics (bls.gov). The number of biology graduates in the workforce is growing. In 2019, there were 2.62 million and in 2020, there were 2.73 million which equates to a 4.39% growth. Biology | Data USA. In 2020, there were 169,859 biology degrees awarded. Biology | Data USA

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.

Using the keyword: biology: and the degree: Associate degree, in the link provided (MHEC Academic Program Inventory), three community colleges were listed – Carroll Community College, Prince George's Community College, and Wor-Wic Community College.

When comparing the proposed program with Carroll Community College, there are commonalities and differences. Both programs require a 2-semester biology, 1-semester genetics, and a 4-semester chemistry (general and organic). Carroll Community College does not require Calculus I and II and does not include physics. Unlike Carroll, CSM does not require microbiology. Associate Degree in Biology | Carroll Community College (carrollcc.edu)

When comparing the proposed program with Prince George's Community College, both programs require the 2-semester biology and the 4-semester chemistry. Calculus I is required but not Calculus II. The main difference is that Prince George's Community College offers several choices of program electives, with genetics being one choice, while CSM requires genetics. Biology, A.S. - Prince George's Community College (pgcc.edu)

When comparing the proposed program with Wor-Wic Community College, both programs require the 2-semester biology and the 4-semester chemistry. Wor-Wic does not require either Calculus I or II. CSM requires 2-semester physics while Wor-Wic requires only one. Like Prince George's Community College, Wor-Wic offers science electives but does not require genetics. Program: STEM Transfer, Biology Concentration, A.S. - Wor-Wic Community College - Aclog ACMS™ (worwic.edu)

While Wor-Wic and CSM have similar demographics when comparing White students vs. minority students, the minority make-up is di ferent. Wor-Wic is 44.5% White, 26.8% Hispanic/ Latino, and only 12.2% Black/African American. Wor-Wic Community College | Data USA. In contrast, the College of Southern Maryland student enrollment consists of 50.9% White students and 49.1% being minority students. African American/Black students represent 27.3% of the student body. College of Southern Maryland | Data USA. Therefore, the two colleges are serving different minority populations and thus there is need for both programs. In addition, Wor-Wic is 138 miles from CSM and thus are not direct competitors.

Similar degree programs in the geographical area:

| Institution | Program |
|---|---|
| Allegany College of MD | Arts & Sciences Transfer; Biology Concentration |
| Anne Arundel Community College | Arts & Sciences Transfer; Biology Concentration |
| Carroll Community College | Biology |
| Cecil College | Biology |
| Frederick Community College | STEM, concentration in Biology |
| Hagerstown Community College | Arts & Sciences Transfer; Biology Concentration |
| Harford Community College | Arts & Sciences Transfer; Biology Concentration |
| Prince George's Community College | Biology |
| Wor-Wic Community College | STEM, concentration in Biology |

2. Provide justification for the proposed program.

While Carroll Community College may have a similar program, the College of Southern Maryland and Carroll Community College are 87 miles apart in distance; therefore, the two colleges are not competing for the same students. In addition, the College of Southern Maryland has greater diversity, meeting the needs of minority students. Carroll Community College is 81.4% White with only 4.51% Black/African American. Carroll Community College | Data USA. Therefore, the two institutions service a different population and thus are not direct competitors.

Prince George's Community College is a direct competitor with CSM with Prince George's Community College being the closest in proximity and being a predominately Black institution (PBI). The justification for both programs is that Prince George's Community College (PGCC) and CSM do not have the same articulation agreements. CSM has three articulation agreements for the biology concentration with St. Mary's College of Maryland. PGCC does not have any biology articulation agreements with St. Mary's College of Maryland (SMCM). SMCM is located within Southern Maryland and thus CSM is a direct pipeline of students to SMCM. The proximity of SMCM and CSM makes this an affordable option for Southern Maryland students due to the ability to commute to both institutions.

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.

While not an HBI, Prince George's County Community College (PGCC) is considered a Predominantly Black Institution (PBI) and is the closest PBI to the College of Southern Maryland. The justification for allowing both institutions to have a similar program was addressed in the question above.

With regards to transfer institutions, the HBCU institutions in Maryland include Bowie State University, Coppin State University, Morgan State University, and University of Maryland Eastern Shore. Of the 111 biology students who have transferred from CSM between 2014 and 2022, 19 students transferred to an HBCU which means 17% of transferring biology students chose an HBCU. Of the transferring students, 17 transferred to Bowie State University, the closest HBCU to CSM. Therefore, CSM makes a small but significant contribution to Historically Black Institutions.

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.

The primary mission of an HBCU, as defined by the Higher Education Act of 1965 is the education of black Americans. Of the 19 students transferring from CSM to an HBCU, only two students identified as White, one identified as foreign, one identified as Hispanic, and one identified as multi-racial. Therefore, most students transferring from CSM to an HBCU were black Americans, meeting the intended target audience as defined by the HBCU mission. What is an HBCU? | White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity through Historically Black Colleges and Universities

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

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

The proposed program resulted from the mathematics and sciences degree program review. The degree was a barrier to the biology students' success as evidenced by the decline in biology graduates when the Biological Sciences degree was deactivated, and biology became a concentration under Mathematics & Sciences. The chart below shows the number of students who graduated with the new Mathematics and Sciences A.S. Biology concentration versus the deleted Biological Sciences degree. The first column shows the number of students that transferred to a University System of Maryland (Maryland public college) entering as a biology major. What this chart shows is that student interest in biology has not waned and that students are leaving CSM and entering the four-year institution as a biology major at a fairly consistent number. What has changed is the number of students who graduated from CSM before transferring and the graduation rates of the Mathematics and Science A.S. are lower than those that previously graduated with the Biological Sciences A.A.

| | USM Transfers for Biology | Math and Sciences Biology Grads | Biological Sciences Grads |
|---|---|---|---|
| 2014 | 21 | | 12 |
| 2015 | 15 | | 14 |
| 2016 | 11 | | 11 |
| 2017 | 20 | | 8 |
| 2018 | 18 | 2 | 10 |
| 2019 | 14 | 3 | 5 |
| 2020 | 17 | 0 | 2 |
| 2021 | | 2 | |

In addition, there were many differences in the degree requirements between mathematics, biology, and physical science students; therefore, the merger of these concentrations into one program seemed arbitrary and lacked uniformity. The coordinator involved in the program review is the coordinator who will oversee the new biology degree. The faculty in those concentrations will be the same faculty in the new degree. The biology coordinator is Tracey Stuller.

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

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

Assessment of student learning outcomes will be completed using the College of Southern Maryland's required assessment plan. Each academic year at least one program student learning outcome will be assessed and reported to the Director of Academic Assessment for review by the Academic Learning and Assessment Committee (ALAC).

Student Learning Outcome 1: Compare basic biological and chemical concepts. This outcome is assessed using the BIO 1060 assignment, "Differentiate between an acid and a base; define pH and describe how it affects the processes of life."

Student Learning Outcome 2: Evaluate issues in the life sciences that impact organisms or the biosphere. This outcome is assessed using the BIO 1070L ecology lab assignment entitled,“Some animals are more equal than others: trophic cascades.”

Student Learning Outcome 3: Apply the scientific method via collecting, analyzing, and reporting scientific data. This outcome is assessed using the BIO 1060L scientific investigation lab activity entitled, “The Pendulum Project – Using the scientific method.”

Student Learning Outcome 4: Use appropriate scientific techniques and technology for experimentation and data collection. This outcome is assessed using the BIO 1060L lab report on photosynthesis entitled, “you light up my life.”

These program outcomes are essential to any biological field and the core courses provide a strong science foundation in preparation for entering the biological sciences. The course-level outcomes will be unchanged since the course outcomes meet the needs of the program.

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

Curriculum Schema

| Course | Credits |
|---|---|
| SEMESTER 1 – | |
| ENG 1010 - Composition and Rhetoric | 3 |
| CHE 1200 – General Chemistry I<br>CHE 1200L – General Chemistry I Lab | 4 |
| MTH 1200 – Calculus I and Analytic Geometry | 4 |
| BIO 1060 – Principles of Biology I<br>BIO 1060L – Principles of Biology I Lab | 4 |
| SEMESTER 2 | |
| BIO 1070 – Principles of Biology II<br>BIO 1070L – Principles of Biology II Lab | 4 |

| | |
|---|---|
| CHE 1210 – General Chemistry II<br>CHE 1210L – General Chemistry II Lab | 4 |
| ENG 1020 – Composition and Literature | 3 |
| MTH 1210 – Calculus II | 4 |
| SEMESTER 3 | |
| PHY 1310 – Calculus-Based Physics I: Mechanics and Fluids and Lab | 4 |
| Arts/Humanities | 3 |
| CHE 2200 – Organic Chemistry I<br>CHE 2200L – Organic Chemistry I Lab | 4 |
| PSY 1010 – General Psychology | 3 |
| 1 credit elective | 1 |
| SEMESTER 4 | |
| Social Science | 3 |
| BIO 2040 – Principles of Genetics<br>BIO 2040L – Principles of Genetics Lab | 4 |
| CHE 2210 – Organic Chemistry II<br>CHE 2210L – Organic Chemistry II Lab | 4 |
| PHY 2300 –Calculus-Based Physics II: Vibrations, Heat, and Electricity with Lab | 4 |
| TOTAL | 60 credits |

Course Descriptions

BIO-1060 - Principles of Biology I* (S) (3)
Prerequisite: Reading Placement; or RDG-0800; or take one of the following: IRW-0900A; IRW0900B; IRW-0900C; and MTH-0992 or MTH-0950 or higher

In this course for science majors, students study basic chemistry, the molecules of life, cellular structures and function, membrane transport, enzymes, cellular metabolic pathways and photosynthesis. They also study DNA, the genetic code and gene expression.

Other topics studied include intercellular communications. The design and functions of an animal system is explored. Credit for this course may be earned through Advanced Placement Examination. For students in the Arts and Sciences: Biological Sciences program, credit may not be earned for both BIO 1060 and BIO 1020. This course satisfies the General Education Biological Science requirement.

BIO-1070 - Principles of Biology II* (S) (3)
Prerequisite: Reading Placement; or RDG-0800; or take one of the following: IRW-0900A; IRW0900B; IRW-0900C; and MTH-0992 or higher

In this course for science majors, students study population ecology, classical genetics. Also studied are evidence for evolution, early life on earth, chemical evolution, trends in plant, invertebrate, vertebrate and human evolution and biodiversity. For students in the Arts and Sciences: Biological Sciences program, credit may not be earned for both BIO 1070 and BIO 1010. This course satisfies the General Education Biological Science requirement.

BIO-1060L - Principles of Biology I Lab* (S) (1)
Co-requisite: BIO-1060

Students perform hypothesis formulation and testing using experiments in chemical identification, diffusion and osmosis, enzymes, cellular respiration and photosynthesis. Also included are exercises in DNA purification and electrophoresis of DNA. Credit for this course may be earned through Advanced Placement Examination. For students in the Arts and Sciences: Biological Sciences program, credit may not be earned for both BIO 1060L and BIO 1020L. This course satisfies the General Education Biological Science requirement.

BIO-1070L - Principles of Biology II Lab* (S) (1)
Co-requisite: BIO-1070

Students carry out exercises in ecology, mitosis, meiosis, population genetics, Hardy/Weinberg Equilibrium, and plant and animal diversity. Credit for this course may be earned through Advanced Placement Examination. For students in the Arts and Sciences: Biological Sciences program, credit may not be earned for both BIO 1070L and BIO 1010L. This course satisfies the General Education Biological Science requirement.

CHE-1200 - General Chemistry I* (S) (3)
Prerequisite: Take CHE 1050 and CHE 1050L (Score 20 or above on California Chemistry Diagnostic Test and waive CHE-1050/CHE-1050L); Reading Placement; or take one of the following: IRW 0900A, IRW 0900B, or IRW 0900C; and MTH 1115 or MTH 1120 or MTH 1150.

Students learn fundamental principles of chemistry based on a study of the physical and chemical properties of the metallic and nonmetallic elements. Topics include the structure of matter, symbols, formulas and equations, chemical bonding, gaseous state and the kinetic molecular theory, solutions, oxidation reduction, the periodic table, and thermochemistry. Credit for this course may be earned through Advanced Placement Examination. This course satisfies the General Education Physical Science requirement.

CHE-1200L - General Chemistry I Lab* (S) (1)

Prerequisite: "C" or better in CHE-1050 or take co-requisite course

Co-requisite: CHE-1200

Lab work includes basic chemical lab techniques and safety precautions and experiments in volumetric and gravimetric analysis. Computer assisted data collection and analysis is also performed. This course satisfies the General Education Physical Science requirement.

CHE-1210 - General Chemistry II* (S) (3)

Prerequisite: CHE-1200; CHE-1200L

The continuation of CHE-1200 includes chemical equilibrium chemical kinetics, ionic equilibrium, solubility product, hydrolysis, electrochemistry, liquid and solid states, acids, bases and salts. Credit for this course may be earned through Advanced Placement Examination. This course satisfies the General Education Physical Science requirement.

CHE-1210L - General Chemistry II - Lab* (S) (1)

Co-requisite: CHE-1210

Lab work includes computer assisted-data collection and analysis, lab techniques and safety precautions during experiments in equilibrium, reaction rates, and titration. Students also perform several qualitative analysis experiments. This course satisfies the General Education Physical Science requirement.

CHE-2200 - Organic Chemistry I* (S) (3)

Prerequisite: CHE 1210 and CHE 1210L

Students are introduced to organic chemistry according to family, with integration of aliphatic and aromatic compounds. The basic interdependence of properties and structure is demonstrated using a mechanistic approach. This course satisfies the General Education Physical Science requirement.

CHE-2210L - Organic Chemistry II - Lab* (S) (1)
Co-requisite: CHE-2210

This continuation of CHE-2200 lab includes experimentation involving reaction kinetics and analysis; and interpretation of infrared, nuclear magnetic resonance, and mass spectra of organic compounds. This course satisfies the General Education Physical Science requirement.

CHE-2210 - Organic Chemistry II* (S) (3)
Prerequisite: CHE-2200; CHE-2200L

This course continues to develop the principles and processes presented in CHE 2200 including nucleophilic substitution, nucleophilic addition, and carbanion chemistry. This course satisfies the General Education Physical Science requirement.

CHE-2200L - Organic Chemistry I - Lab* (S) (1)
Co-requisite: CHE-2200

Lab work includes preparation, separation, purification, and identification of typical organic compounds. Chromatographic techniques receive special emphasis.

ENG-1010 - Composition and Rhetoric* (E) (3)
Prerequisite: ENG 0900; and RDG 0800; or placement

Students in this course complete their first semester college-level composition course. Students focus on planning, organizing, and developing a variety of argumentative compositions. Students practice the conventions of written Standard American English, gain information literacy skills, and learn research and documentation techniques, including conducting online and print research and documenting sources. By the end of the semester, students demonstrate their ability to write a unified and coherent argument-based essay of about one thousand words that incorporates research and is nearly free of grammatical, mechanical, and structural errors. Students should refer to the schedule of classes for sections of this course taught in a computer lab. Students must pay an additional lab fee when taking this course in a computer-assisted classroom. Students may earn credit for this course through CLEP or Advanced Placement Examination. A minimum grade of "C" is required to pass the course. This course satisfies the General Education English Composition requirement.

ENG-1020 - Composition & Literature* (H) (3)
Prerequisite: ENG 1010 or ENG 1010T

Students in this course complete their second semester college-level composition course. Using critical literary analysis, students build on the planning, organizing, and critical analysis skills learned in ENG-1010, Composition and Rhetoric. Students use literature (short fiction, poetry, and drama) as the basis of their critical analysis and to extend, deepen, and illuminate their own experiences and connections with the larger world and contemporary issues. Students further master the conventions of written Standard American English, information literacy skills, and research and documentation techniques including conducting online and print research and documenting sources. By the end of the semester, students demonstrate their ability to write a unified, coherent argument-based essay that is nearly free of grammatical, mechanical, and structural errors.

MTH-1200 - Calculus I and Analytic Geometry* (M) (4)
Prerequisite: MTH 1150; or MTH 1120 and MTH 1130

This first course in the calculus sequence is intended for students in the fields of mathematics, engineering, and the physical and life sciences. Topics include limits, continuity, derivatives, basic differential equations, parametric equations, indefinite and definite integration. Differential calculus applications include L'Hopitals Rule, curve sketching, optimization, Newton's Method, and rate problems, and integral calculus applications include areas of regions. This course satisfies the General Education Mathematics requirement.

MTH-1210 - Calculus II* (M) (4)
Prerequisite: MTH 1200

This continuation of MTH 1200 includes integral applications such as volumes of solids, arc length, moments and centers of mass, areas of surfaces of revolution, work done by a variable force, fluid pressures and forces. Also introduced are transcendental functions, techniques of integration including numerical integration and improper integrals, sequences and series and their applications in differential and integral calculus, conic sections and polar coordinates. This course satisfies the General Education Mathematics requirement.

PSY-1010 - General Psychology (B) (3)
Prerequisite: Reading Placement; or RDG-0800; or take one of the following: IRW-0900A; IRW0900B; IRW-0900C
This course provides an overview of the scientific study of human behavior and mental processes. Topics include the history of psychology, research methods, neuroscience, sensation, perception, learning, motivation, cognition, abnormal behavior, personality theory, social psychology, and other relevant topics.

SCE-1020 - Fundamentals of Research (1)
Prerequisite: Take BIO-2980 or CHE-2980 or ENV-2980 or PHY-2980.

This 1 credit online course is intended as an introduction to research for STEM (Science, Technology, Engineering, and Mathematics) majors. Students learn the scientific method, reading and writing scientific literature, the collaboration of STEM fields, safety and ethics of experimentation, and the importance of utilizing proper statistics, graphs, charts, and tables for research purposes.

PHY-1310 - Calculus-Based Physics I: Mechanics and Fluids with Lab (S) (4)
Prerequisite: MTH-1200
Co-requisite: MTH-1210

This calculus-based course is the first of a three course physics sequence. Topics include kinematics, the laws of motion, force and energy, principles of mechanics, linear momentum, rotation, gravity, and properties of fluids. Lab work includes experiments on vectors, equilibrium, force, motion, energy, momentum, and properties of materials.

PHY-2300 - Calculus-Based Physics II: Vibrations, Heat, and Electricity with Lab (4)
Prerequisite: MTH-1210, PHY-1210 and PHY-1210L OR PHY-1310

This calculus-based course is the second of a three course physics sequence. Topics include thermodynamics, vibrations, waves, electrostatics, and circuits. Lab work includes experiments on oscillatory motion, waves, sound, thermodynamics, electricity, and circuits.

BIO-2040 - Principles of Genetics* (S) (3)
Prerequisite: BIO-1020; BIO-1020L or BIO-1060; BIO-1060L or biology placement; plus MTH-0992 or MTH-0950 or higher

Students study the principles of classical genetics and the molecular basis of inheritance in terms of structure, function and changes in genetic material in viruses, bacteria and higher organisms; transmission and expression of genetic material; extra genetic control of metabolism, recombinant DNA and bioengineering. Students solve real and simulated problems using principles of inheritance. This is a web based course, allowing students a maximum of interaction and access to resources. This course satisfies the General Education Biological Science requirement.

BIO-2040L - Principles of Genetics Lab* (S) (1)
Co-requisite: BIO-2040

In this laboratory, students investigate classical Mendelian and modern molecular genetics using computer simulations. In addition, students perform other experiments. Use of computer software for data acquisition and statistical analysis is emphasized. Discussion of experimental results and analysis of the data collected are an integral part of the laboratory. This is a web-hybrid course. This course satisfies the General Education Biological Science requirement.

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

The general Education requirements will be met as follows:

| **AA, AS, ASE, AAT** | |
|---|---|
| **General Education** | |
| 3 credits English Composition | ENG-1010 - Composition and Rhetoric* (3) |
| 6 credits Arts/Humanities | ENG-1020-Composition and Literature (3)<br>Arts and Humanities of choice which could include one of the following:<br>COM-1010 – Basic Principles of Speech Communication or COM-1650 – Introduction to Public Speaking (3) |
| 3 credits Biological/Physical Sciences | CHE-1200 General Chemistry I (3) |
| 4 credits Biological/Physical Sciences (with lab) | PHY-1310 – Calculus-based Physics I (4) |
| 6 credits Social/Behavioral Sciences | PSY-1010 – General Psychology (3)<br>Social science elective which could include:<br>SOC-1010 – Introduction to Sociology (3) |
| 3 credits Mathematics | MTH-1200 – Calculus 1 and Analytic Geometry (4) |
| Other General Education (from above categories) (3-11 credits) | BIO-1060- Principles of Biology I (3) |
| **MHEC requires 28-36 credits** | **Total General Education= 29** |
| **Major requirements:** | BIO 1060L (1), BIO 1070 (3), BIO 1070L (1), BIO 2040 (3), BIO 2040L (1) |
| | CHE 1200L (1), CHE 1210/L, (4) CHE 2200/L (4), CHE 2210/L (4) |
| | PHY 2300 (4) |
| | MTH 1210 (4) |
| | Program Electives (1) |
| | **Total Program Major Biology = 31** |
| | **Total Biology, AS = 60 credits** |

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

There are no specialized accreditation or graduate certification requirements for this program and its students.

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

The College of Southern Maryland is not contracting with another institution.

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.

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.

The College of Southern Maryland will provide clear, complete, and timely information on the curriculum, academic support services, financial aid resources and payment policies through the college's catalog and web site. In addition, students receive information about technical requirements and use of the learning management system through the college's Help Desk and support from the Distance Learning and Faculty Development area of the college. Professional development opportunities are available for faculty to enhance pedagogical skills to better support student success.

Advertising, recruiting, and admissions materials clearly and accurately represent the proposed program and available student services. Prospective and current students have access to the same online materials detailing these resources. In addition, marketing materials are developed through collaboration among academic leaders and the Marketing staff using a shared platform for proofing and editing materials.

See below evidence of student access to information and support:

https://catalog.csmd.edu/ https://www.csmd.edu/student-services/index.html

https://www.csmd.edu/student-services/learning-support/tutoring/index.html

https://www.csmd.edu/programs-courses/credit/online-learning/getting-started.html

## Recommended Course Sequence:

First Semester

| Course | Credit |
|---|---|
| ENG1010 | 3 |
| CHE 1200 | 3 |
| CHE 1200L | 1 |
| BIO 1060 | 3 |
| BIO 1060L | 1 |
| MTH 1200 | 4 |
| Total | 15 |

Second Semester

| Course | Credit |
|---|---|
| ENG 1020 | 3 |
| CHE 1210 | 3 |
| CHE 1210L | 1 |
| BIO 1070 | 3 |
| BIO 1070L | 1 |
| MTH 1210 | 4 |
| Total | 15 |

**Third Semester**

| Course | Credit |
|---|---|
| PSY 1010 | 3 |
| CHE 2200 | 3 |
| CHE 2020L | 1 |
| PHY 1310 | 4 |
| 1 credit elective | 1 |
| Arts/ Humanities | 3 |
| Total | 15 |

**Fourth Semester**

| Course | Credit |
|---|---|
| CHE 2210 | 3 |
| CHE 2210L | 1 |
| PHY 2300 | 4 |
| BIO 2040 | 3 |
| BIO 2040L | 1 |
| Social Science | 3 |
| Total | 15 |

## Program Description for the Catalog:

This associate of science transfer option is designed for part- and full-time students with a specific academic and/or professional interest in the areas of biology, botany, zoology, anatomy and physiology, microbiology, and genetics. This option introduces this discipline within the context of allied subject areas, preparing students for specific concentration at a four-year Maryland state college or university.

The following is a sample list of occupations for which such a concentration might be appropriate: horticulturist, chiropractor, dentist, pharmacist, podiatrist, veterinarian, agricultural scientist, forester, conservation scientist, biologist, pharmacologist, oceanographer, optometrist, physician.

H. Adequacy of Articulation

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

The mathematics and sciences biology concentration is being separated out into its own degree. The intention is to have the existing articulation agreements re-signed under the new degree designation.

The mapping of the new curriculum was made based on Biology's existing three St. Mary's College of Maryland's articulation agreements and the two most common college transfer institutions. In addition to the biology-specific transfer agreements, the biology concentration from the Mathematics and Sciences degree had an articulation agreement in biochemistry with Stevenson University. There is also one out of state agreement for the biology concentration with Virginia Commonwealth University. Please see Appendix A for Articulation Agreements.

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 faulty member will teach in the proposed program.

*Need to be at least 50% full time faculty

| Faculty Member Name | Terminal Degree | Full-Time or Part-Time | Courses Taught |
|---|---|---|---|
| Terry Jordon | MS | Adjunct | BIO 1020/L 1010/L, 1060/L 1070/L |
| Bill Wultich | MS | Adjunct | BIO 1020/L 1010/L, |
| Gabi Zabel | MS | Adjunct | BIO 1020/L 1200/L, 1060/L 1070/L |
| Paul Billeter | MS | Adjunct | BIO 1020/L 1200/L, |
| Michelle O'Donnell | MS | Adjunct | BIO 1020/L |
| Wendy Farrell | MS | Adjunct | BIO 1020/L |
| Meenu Vikram | PHD | Adjunct | BIO 1020/L 1010/L, 1060/L 1070/L |
| Rachael Bateman | MS | Full-time | BIO 1020/L, 1060/L 1070/L |

| | | | |
|---|---|---|---|
| Valerie Shelton | PHD | Full-time | CHE 1200/L, 1210/L, 2200/L, 2210/L |
| Buddhadeb Mallik | PHD | Full-time | CHE 1200/L, 1210/L |
| Eleazar Ekwue | PHD | Full-time | PHY 1310 |
| James McCrary | MS | Full-time | PHY 1310 |
| Tracey Stuller | DVM | Full-time | BIO 1020/L, 1060/L, 1070/L, 1010/L |
| Lori Crocker | MS | Full-time | BIO 1060/L, 1020/L, 1200, 1070/L |
| Margaret Bolton | MS | Full-time | BIO 2040/L |
| Edith Carron | PHD | Full-time | BIO 2010/L, 1020/L, 1060/L, 1070/L |
| Diane Carter | MS | Adjunct | BIO 1020/L, 1060/L, 1070/L |
| Rachel Clark | MS | Adjunct | BIO 1020/L, 1060/L |

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

b) The learning management system

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

All faculty teaching in the Biology program are highly educated and have the expertise to deliver quality classroom and laboratory teaching that enables students to achieve the student learning outcomes. In addition, the College of Southern Maryland provides ongoing pedagogy training for faculty in evidenced-based best practices including pedagogy that meets the needs of the students, training related to use of the learning management system, and training related to best-practices for distance education.

The college's Distance Learning and Faculty Development area has designed numerous online courses that prepare faculty to use the college's learning management system, BrightSpace, D2L. Faculty (full-time and adjunct) are required to complete this training as a condition of employment. In addition, the college uses an ongoing peer review and support process called Online Academic Rigor and Presence (OARP) to provide education and continuous improvement on best practices related to distance learning. The college's Division of Learning Schools also provide monetary support for faculty to attend professional development. Through the Faculty Development Committee, peer colleagues and guest speakers also address the ongoing education for pedagogy that supports the needs of students.

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.

Students may borrow circulating materials from any of the three CSM library branches. Through the interlibrary loan program (ILL), students can order almost any book, periodical article, or document needed. These materials are generally available within one week of the request. Library resources also include audiovisual collections use in the library and classrooms only. Additionally, substantial material is available through online databases, including ProQuest and EBSCO.

CSM's President assures that appropriate library resources are available to support the needs of this program.

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.

CSM is a leader among Maryland community colleges in offering courses which meet the busy schedules of our students. CSM courses include the following formats: traditional face-to-face courses, asynchronous online courses, real-time technology courses, Hy-flex courses which allow students to choose in-person or remote learning, and Web-hybrid courses which offer a mix of online and traditional classroom face-to-face instruction.

The college makes available state-of-the-art facilities on four campuses to accomplish its mission in support of our community's academic, professional, and self-enrichment pursuits. Theory content classes can meet in the standard classrooms for all concentrations. Standard classrooms include a smart podium, dry erase board, projection screen, and projector. Some classrooms are outfitted with cameras for a hy-flex option. Science labs are equipped with non-flammable lab benches in the form of lines or work groups. Chemistry/microbiology labs have gas hook-ups at the student work stations. The classrooms and laboratories are adequately outfitted and reflect the common set-up seen in other institutions and lab settings. The buildings, classrooms and laboratories are ADA accessible with ramps and elevators where appropriate. No accessibility issues have arisen regarding physical spaces.

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

a) An institutional electronic mailing system, and

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

The software used in each discipline must have a VPAT that is analyzed for accessibility through the CSM accessibility department. The D2L courses have recently instituted the use of Ally, a software that indicates the accessibility of the materials within the course shell. Students are provided with college email addresses and have access to Help Desk support for use of email, the learning management system, and other technology.

CSM's President assures that appropriate physical facilities, infrastructure, and instructional equipment are available to support the needs of this program.

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

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

It is anticipated that the curriculum change will lead to an increase in program enrollment over the next 5 years due to more students staying to complete the associate degree. The program review completed in 2021 showed that once the biological sciences degree program was integrated as a concentration under the mathematics & sciences degree that graduation rates in biology significantly decreased. Approximately, 2/3 of students are not retained (fall to fall retention in biology was 36.3% in 2021 & 25.5% in 2020) and are lost to transfer before degree completion. Enrollment is expected to increase once biology is a stand-alone degree again.

The biology program will use its existing physical and personnel resources. These resources are adequate to support the program's needs.

RESOURCES

Tuition and Fee Revenue:
As of 2021, there were 116 students enrolled in the biology concentration within the mathematics & science degree. According to the 2021 Maryland Higher Education Commission Data Book, 35.5% of the College of Southern Maryland students are full-time and 64.5% are part-time which would equate to 41 full-time and 75 part-time biology concentration students. 2021 Maryland Higher Education Commission Data Book. The program is planning for a 2% increase in enrollment over the next 5 years based on the increased transferability of the new program. The in-county tuition rate of $140/credit is used for budget calculation along with the combined fee rate of 25%/tuition which equates to $35/credit. Tuition and Fees (csmd.edu). The College of Southern Maryland only charges students per credit and does not charge an annual tuition rate.

Year 1 Revenue:

41 full time students + 75 part time students = 116 students X $171.25 per credit X 20 credits per year = $397,300.

Year 2 Revenue:
42 full time students + 77 part time students = 119 students X $171.25 per credit X 20 credits per year = $407,575.

Year 3 Revenue:

43 full time students + 79 part time students = 122 students X $171.25 per credit X 20 credits per year = $417,850.

Year 4 Revenue:

44 full time students + 81 part time students = 125 students X $171.25 per credit X 20 credits per year = $428,125.

Year 5 Revenue:

45 full time students + 83 part time students = 128 students X $171.25 per credit X 20 credits per year = $438,400.

Other Resources:
Reallocated Resources: There will not be reallocation of existing resources.

Grants and Contracts: There are currently no grants and contracts allocated to this program.

Other Sources: There are no other sources of revenue associated with this program.

| TABLE 1: RESOURCES | | | | | |
|---|---|---|---|---|---|
| **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) | $477,750 | $490,000 | $502,250 | $514,500 | $526,750 |
| a. Number of F/T Students | 41 | 42 | 43 | 44 | 45 |
| b. Annual Tuition/Fee Rate ($175 x 30 credits)* | $5,250 | $5,250 | $5,250 | $5,250 | $5,250 |
| c. Total F/T Revenue (a x b) | $215,250 | $220,500 | $225,750 | $231,000 | $236,250 |
| d. Number of P/T Students | 75 | 77 | 79 | 81 | 83 |
| e. Credit Hour Rate | $175 | $175 | $175 | $175 | $175 |
| f. Annual Credit Hours Rate | 20 | 20 | 20 | 20 | 20 |
| g. Total P/T Revenue (d x e x f) | $262,500 | $269,500 | $276,500 | $283,500 | $290,500 |
| 3. Grants, Contracts & Other External Sources (Donations of equipment/supplies and grants) | $0 | $0 | $0 | $0 | $0 |
| 4. Other Sources | 0 | 0 | 0 | 0 | 0 |
| TOTAL (Add 1 – 4) | $477,750 | $490,000 | $502,250 | $514,500 | $526,750 |
| * The credit hour rate ($175) is based upon CSM's current tuition rate of $140 plus 25% combined fee. | | | | | |

1. 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.

EXPENDITURES

Faculty & Administrative & Support Staff, FTE, Salary, and Benefits:

This program is just making biology a stand-alone degree rather than a concentration under a combined mathematics and science degree; therefore, no new personnel or change in supplies will be needed.

Equipment:
Consumable supplies and equipment will be used for lab course management. It is estimated that $12,000 in supplies and equipment will be adequate for lab course support. These will not be new expenses but are included because this is the only expenditure discussed in the MHEC directions that didn't expressly say that it was equipment needs for a new program.

Consumables:
Macromolecule kits, DNA kits, test tubes, yeast, peas, eggs, sugar, gloves, soap, paper towels, glassware, live plants, fast plants, owl pellets, labels, soil, seeds, planting containers, fertilizer, wicks copper sulfate, scalpels, blades, gloves, soap, paper towels, glassware

Solutions:
Catalase, hydrogen peroxide, Hydrochloric acid, sodium hydroxide, ammonia, seltzer, root beer extract, bleach, vinegar, methylene blue, saline solution

Durable Goods:
Laptops, Pasco Powerlinks and software, probes (Carbon dioxide, Temperature, Absolute Pressure, pH, Dissolved Oxygen), Electrophoresis equipment, water bath, Balances, hot plates, bench stands, clamps, stirrers, Microscopes, Dissection trays, plant lights

Preserved Dissection Specimens:
Lancets, nematodes, sponges, clams, crayfish, polychaetes, earthworms, grasshoppers, planarian, leaches

Models:
Hydra, Clam, Crayfish, Earthworm, Fish, Cricket, Pig, Frog, Flatworm

Principles of Biology I cost $838 for supplies per course section; Principles of Biology II costs $558 for supplies per course section; Genetics costs $520 for supplies per course section. The other courses in this program are shared with other degrees.

Library:
Because this is only a change from being a concentration to a stand-alone program, there will be no new library expenses as a result of this change.

| TABLE 2: PROGRAM EXPENDITURES: | | | | | |
|---|---|---|---|---|---|
| **Expenditure Categories** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| 1. Faculty (b + c below) | 0 | 0 | 0 | 0 | 0 |
| a. Number of FTE | 0 | 0 | 0 | 0 | 0 |
| b. Total Salary | 0 | 0 | 0 | 0 | 0 |
| c. Total Benefits | 0 | 0 | 0 | 0 | 0 |
| 2. Admin. Staff (b + c below) | $0 | $0 | $0 | $0 | $0 |
| a. Number of FTE | 0 | 0 | 0 | 0 | 0 |
| b. Total Salary | $0 | $0 | $0 | $0 | $0 |
| c. Total Benefits | $0 | $0 | $0 | $0 | $0 |
| 3. Support Staff (b + c below) | $0 | $0 | $0 | $0 | $0 |
| a. Number of FTE | 0 | 0 | 0 | 0 | 0 |
| b. Total Salary | $0 | $0 | $0 | $0 | $0 |
| c. Total Benefits | $0 | $0 | $0 | $0 | $0 |
| 4. Technical Support and Equipment | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 |
| 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) | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 |

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.
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.

The College of Southern Maryland uses a systematic process of assessment for program and course evaluation. This process supports the institutional value of Excellence which is defined as committing to high standards and clear expectations. The systematic process of assessment collects information to determine whether CSM's academic offerings are having the appropriate educational impact on students. The process is outlined below.

Program Assessment at CSM is a cyclical process that includes:

1. Program Reviews conducted every five-six years, or more often as needed.
2. Academic certificate programs are included within the review of degree programs.
3. Program Monitoring conducted every year as part of the End of Year (EOY) report.
4. Program Assessments of Student Learning conducted on a cycle established by faculty.

In addition, CSM conducts course evaluations every semester or, more often when deemed necessary.

The program reviews include collecting and analyzing information regarding student retention, student and faculty satisfaction, and cost-effectiveness of the program. The program review consists of a self-study, an external review, and an executive summary which includes an action plan for improving any areas of deficit mentioned above.

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.

The College of Southern Maryland is focusing intently on Diversity, Equity, Inclusion, and Belonging (DEIB) goals. By joining Achieving the Dream in 2019, the College of Southern Maryland is actively seeking to improve student learning with a sharp focus on closing equity gaps according to Institutional Equity (csmd.edu). In 2021, the college's Board of Trustees developed four strategic goals with the second goal being to ensure equity in all programs and services.

Meeting this goal has four strategies:

- Improve hiring practices to ensure equity for all
- Use disaggregated data to close equity gaps
- Expand digital access and technology to ensure equity for all learners
- Strengthen cultural competency among all employees

The Equity and Inclusive Diversity Office at the college works to nurture an environment at CSM that is welcoming, inclusive, and restful for all students, staff, faculty, and visitors according to Equity and Inclusive Diversity (csmd.edu).

In addition, the College of Southern Maryland promotes a civility statement to further support a sense of inclusion and belonging. The college defines civility as the demonstration of respect for others through basic courtesy and the practice of behaviors that contribute toward a positive environment for learning and working. While on any college campus or facility, attending any college event, or on any college electronic/cyber space (online course, email, telephone, etc.), faculty, staff, students, and visitors can all have the expectation of civility from one another (Civility Statement (csmd.edu)).

The college views the following ideals as fundamental to civil behavior:

- Courteous and honest communication in both face-to-face and electronic environments
- Fair and just treatment of individuals
- Freedom from harassment
- Collegiality
- Support for a diverse campus community
- Adherence to the values of the professions in dealings with students, colleagues, and associates
- Respect for diverse cultures and points of view
- Restraint from vulgar and offensive language

Members of the college community can expect these ideals are modeled consistently by trustees, administrators, faculty, and staff.

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

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

This program is not identified as a 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.

This program will not be offered as a distance education program.

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

The program is not offered as a distance learning program.