ACADEMIC PROGRAM REVIEW SELF-STUDY CRITERIA
Associate of Science in Biology

. **Executive Summary**

The executive summary provides a high-level overview of the program: history, mission, goals, alignment to the institution, student and community demand, and a data summary of student enrollment, faculty, graduation rate, retention trend and time to completion.

- Please provide a brief description on the history of the degree program including when it was first created, who were the key parties involved in its creation, and why it was initially introduced to Diné College.
    - This knowledge is lost in time. We believe the program started approximately 1975, by the biology faculty at the time. AS Biology programs serve as steps to BS Biology programs and 2-year professional programs, such as nursing.
- Briefly describe the program's mission/goals and how it aligns with the institution's mission, the institution's strategic goals and educational philosophy.

    - **Program Mission Statement**

Program Mission Statement
The AS in Biology program will have adequate preparation for students to continue their education in Biological Sciences or pursue a job in a related field.

    - **Program Goal**

Program Goal
AS Biology 1. Students will take the basic science prerequisites for biology technician work, or for further academic programs in biology or related areas. 2. Students will understand and be able to integrate important relationships between their traditional Diné knowledge and the western science knowledge. 3. Students will understand relationships between the core fundamental sciences and their professional career work and goals in the biological sciences.

    - The AS in Biology aligns with the college mission, goals and philosophy by being an education program designed to help Navajo students obtain a good job or higher education program entry. It helps Navajo students understand how their Native culture is related to western culture and science so they will be successful and fulfilled individuals in today's modern world and in their family and community at home.

- Please provide a brief description on the purpose of the degree program such as meeting the needs of the community, the Navajo Nation, or the student demands for the program.
    - The AS Biology program is a traditional education program designed to help students obtain a good job or successful enrollment in a higher-level academic

program in order to obtain a good job. It also provides students with an understanding of nature from the western science point of view and in turn how their Native cultural knowledge relates to their discipline knowledge.

- Provide an overview of the programs full-time and part-time enrollment, number of degrees awarded, full-time faculty, adjunct faculty, graduation rate, retention rate, and time to completion rate over the last four academic years. Below is the data available for this:

Table 1: Overview Data Summary

Overview – Fall Only	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Undergraduate Headcount	20	19	23	36
Total Student Full-time Enrollment	11	9	11	21
Total Student Part-time Enrollment	9	10	12	15
Total Students that graduated (fall & spring)	3	5	4	8
Cohorts: The data shown here are cohorts by term.	**Fall 2020**	**Fall 2021**	**Fall 2022**	**Fall 2023**
# of students in cohort (FTF & NT)	**4**	**2**	**9**	**9**
Persistence Trend (fall to spring)	75%	50%	44%	44%
Retention Trend	25%	50%	44%	44%
Graduation Trend				
Following a Cohort of students from 2018 over the course of six years, ALL programs at the institution have a 7% chance of students declaring a major and graduating with the major.				

B. Self-Study Summary

Short description of what academic years the review covers:

Fall 2020 to Fall 2023

Names of individuals contributing to the AS Biology APR:

Don Robinson, Shazia Hakim, Partha Saha, Barb Klein, Karen Hannah Freedman.

Indicate when the last time this program was reviewed and what has changed since the last APR:

Last reviewed through APR in 2021. The Checklist was updated to make sure BS Biology prerequisites were taken by the time the student would transfer to the junior year of the BS Biology program. This also includes math content required for AGEC-S (MTH 190 and MTH 213 or MTH 191).

C. Degree Program Overview

In the Degree Program Description of the Self-Study Report, Schools will provide information pertaining to the degree program curriculum, Diné Identity and Program Uniqueness, instruction delivery methods (modality and locations), program faculty and aspects of student learning.

C.1. Curriculum

- Please provide a comprehensive description of the curricula for the degree program including a list of required courses, general education courses, and electives, as well as an analysis of course progression and academic rigor. Include how and where the courses are offered, and a review of course prefixes, course prerequisites, course descriptions and credit hours as listed in the catalog:

Biology (A.S.)
Students selecting Biology will complete a broad program in biological and related physical sciences. They will be prepared to pursue employment or further studies in fields such as zoology, botany, microbiology, ecology, wildlife biology, molecular biology, biotechnology, as well as many other fields of biology according to their interests.
Program Requirements Credits
BIO 182 General Biology II 4
Choice of one (1):
(BS Biology program requires CHM 151 and 152 before Junior year)
CHM 152 General Chemistry II
or
CHM 300 Fundamental Organic Chemistry
(BS Biology students take organic in Junior year)
4
Choice of two (2): 8 credits:
MTH 190 Pre-Calculus
and
MTH 213/PSY 213 Statistics
or
MTH 191 Calculus I
or
MTH 251 Calculus for Life Science and Business
(4)
(The AGEC-S block for Math & Science majors requires MTH 191 or MTH 213. BS Biology program requires MTH 190 and either 213 or 191 before junior year.)

Biology Electives
Any 200 level or above Biology course 8
Program Credits: 24
Degree Earned Credits
General Education 39-41
Program Requirements 24
Total Credits Earned: 63-65

Courses:
BIOLOGY (BIO)
BIO 100 Biology Concepts (4)
This one-semester, non-major introductory course covers basic principles and concepts of biology, including how organisms obtain and use energy, reproduction, heredity, evolution, and response to the environment. Environmental issues affecting life, such as global warming, are introduced.
BIO 165 Cancer Prevention and Control (3)
Cancer Prevention and Control focuses on the core concepts of biology and public health as they relate to cancer. The course addresses both the biological processes within cells that may result

in cancer and public health approaches to cancer, including cancer epidemiology, education, screening, early detection, and treatment options. Special emphasis is placed on the impact of language and cultural issues in developing and implementing cancer prevention programs. Numerous basic concepts of biology and public health are covered, so students should have taken at least one course in introductory biology and one course in introductory public health before enrolling in this course.

BIO 170/CMA 170/PUH 170 Medical Terminology (3)

Prerequisite: ENG 101 (BIO/PUH Majors Only)

Basic tools are provided, such as root words, prefixes, and suffixes, for building an effective verbal and written biomedical vocabulary.

BIO 181 General Biology I (4)

Prerequisite: ENG 101 or instructor's permission

One year of high school chemistry or one semester of college chemistry is recommended. This course entails basic principles of structure and function of living things at the molecular, cellular, and system levels of organization. This course meets for three hours lecture and three hours laboratory per week.

BIO 182 General Biology II (4)

A survey of biodiversity and core concepts in ecology and evolution. Specifically, a study of the biosphere, ecosystems, populations, evolutionary mechanisms and life phylogenies. Life history strategies will be surveyed among prokaryotes, protists, plants, animals and fungi.

BIO 201 Human Anatomy and Physiology I (4)

Prerequisite: BIO 181.

Anatomy and physiology is the study of the structure and function of the human body. Selected topics include cells, tissues, and the integumentary, skeletal, muscular, and nervous systems. This course meets for three hours lecture and three hours laboratory per week.

BIO 202 Human Anatomy and Physiology II (4)

Prerequisite: BIO 181, 201.

This course is a continuation of the study of the structure and function of the human body. Selected topics include the endocrine, circulatory, respiratory, digestive, urinary, and reproductive systems. This course meets for three hours lecture and four hours laboratory per week.

BIO 205 Microbiology (4)

Prerequisite: BIO 181 and another BIO class (college level) or CHM class.

One semester of college-level chemistry is recommended. Students study micro-organisms and their relationship to health, ecology, and related fields. The field of microbiology is extensive, and in this class emphasis will be on basic principles and their application in medical microbiology. The class will meet for three hours lecture and four hours laboratory per week.

BIO 221 Invertebrate Biology I (4)

Prerequisite: BIO 181.

This is part one of a two semester sequence and involves the survey of Phyla Porifera through Chordata including Blast coelomate by using selected taxa to illustrate concepts in evolution, systematics, physiology, morphology, life history, ecology and behavior. Lectures will be focusing on organizing and interpreting information about invertebrate organisms in order to illustrate evolutionary relationships within and between taxa as well as adaptations that allow Species to inhabit specific habits. Laboratories will supply preserved examples of taxa.

BIO 222 Invertebrate Biology II (4)

Prerequisite: BIO 181.

This is part two of a two-semester sequence and involves the survey of Phyla Annelida through Arthropoda by using selected taxa to illustrate concepts in evolution, systematics, physiology, morphology, life history, ecology and behavior. Lectures will be focusing on organizing and interpreting information about invertebrate organisms in order to illustrate the following: Evolutionary relationships within and

between taxa as well as adaptations that allow species to inhabit specific habitats. Laboratories will supply reserved examples of taxa.

BIO 284 Plant Biology (4)

The study of principles and processes in plant biology with emphasis on vascular plants. Students survey the plant kingdom. Course includes study of Native American Medicinal Plants. This course meets for three hours lecture and three-hours laboratory per week.

BIO 296 Scientific Research Seminar (1)

The course is for science and engineering majors, but anyone who is interested in learning more about science-related research is also welcome. It offers a broad-based background in current scientific research. Weekly discussions on various methods used in scientific research are covered in the course along with some hands-on research experiences.

CHEMISTRY (CHM)

CHM 130 Fundamental Chemistry (4)

Students receive a survey of modern chemistry and the relationship of chemical principles to familiar aspects of living, including topics relevant to Navajo culture. The faculty will discuss theories of atoms, molecules, chemical bonds, chemical reactivity, solutions, and the chemical basis of life. This course is suitable for allied health and education majors. This course meets for three hours lecture and three hours laboratory per week.

CHM 151 General Chemistry I (5)

Prerequisite: High school chemistry plus MTH 110 or equivalent or instructor's permission.

The first semester of this two-semester sequence presents fundamental concepts of chemistry with an emphasis on theoretical and physical principles; atomic and molecular structure and theory; principles of chemical bonding, and their impact on the properties of gases, liquids, and solids. Laboratory experiments illustrate chemical principles, some of which are quantitative in nature, involving titrimetric and gravimetric methods. Instrumentation in this class includes use of the spectrophotometer. This course meets for four hours lecture and three hours laboratory per week.

NOTE: This course is designed for pre-professional, engineering and chemistry majors.

CHM 152 General Chemistry II (4)

Prerequisite: CHM 151.

This course is a continuation of CHM 151. Topics include physical states of matter, equations of state, phase transformations, solutions and colloids, chemical thermodynamics and kinetics, electrochemistry, ionic equilibrium, and instrumental analysis. This course meets for three hours lecture and three hours laboratory per week.

CHM 300 Fundamental Organic Chemistry (4)

Prerequisite: CHM 130 or equivalent or instructor's permission.

In this course, students survey modern organic chemistry. Topics include structure, properties, and reactions of the various classes of organic chemicals, such as saturated and unsaturated hydrocarbons, alcohols, halides, carbonyls, and amines. Reaction mechanisms are introduced with examples such as simple synthesis and biochemical reactions. This course is designed for allied health and nursing majors. This class meets for three hours lecture and three hours of laboratory per week.

CHM 301 General Organic Chemistry I (5)

Prerequisite: CHM 152 or instructor's permission.

This is the first course in a two semester sequence that will study the structure, physical properties, synthesis, and typical reactions of the various series of aliphatic, alicyclic, and aromatic compounds, with attention to reaction mechanisms and applications to living systems. This course meets for four hours lecture and three hours laboratory per week. *NOTE: This course is for pre-professional, engineering,*

and chemistry majors.

CHM 302 General Organic Chemistry II (4)

Prerequisite: CHM 301.

This course is a continuation of CHM 301. Topics include spectroscopic applications in organic chemistry; condensation reactions of carbonyl compounds, rearrangement reactions, and mechanisms; and chemistry of fats, amines, proteins, and carbohydrates. This course meets for three hours lecture and three hours laboratory per week.

MTH 110 College Algebra (4)

Prerequisite: Placement test or instructor's permission.

Covers functions and their graphs, including linear, quadratic, polynomial, rational, exponential, and logarithmic functions. Also covers the algebraic concepts necessary for the study of these functions. Four lecture hours per week.

MTH 114 College Mathematics/Quantitative Reasoning (4)

Prerequisite: Placement test or instructor's permission.

Contemporary quantitative methods, especially descriptive statistics, elementary probability, statistical inference, linear and exponential models of growth and decay, and discrete models. Four lecture hours per week.

MTH 190 Pre-Calculus (4)

Prerequisite: Minimum of grade of 'C' in MTH 110 or instructor's permission.

Preparation for students in STEM majors. The course will cover trigonometry and analytic geometry, including trigonometric functions, analytic trigonometry, laws of sines and laws of cosines, polar equations, vectors, ellipse, hyperbola, and parabola.

MTH 191 Calculus I (4)

Prerequisite: Minimum grade of 'C' in MTH 190 or instructor's permission.

Preparation for students in STEM majors. The course will cover limit and continuity of functions, derivatives, application of differentiation, integrals and fundamental theorem of calculus.

MTH 213/PSY 213 Statistics (4)

Prerequisite: Minimum grade of 'C' in MTH 110 or MTH 114 or instructor's permission.
Cross listed with PSY 213.

Representation of data, measures of central tendency; standard deviation; sampling; normal, chi-square, student's, T and F distributions; and regression and correlation. Basic concepts of experimental design and statistical analysis involved in quantitative research.

MTH 251 Calculus for Life Science and Business (4)

Prerequisites: Minimum grade of 'C' in MTH 190 or instructor's permission.

Differential and integral calculus of elementary functions. Introduces differential equations. Emphasizes applications to the life sciences and business**.**

PHY 110 Algebra-based Physics I (4)

Prerequisite: MTH 110 or concurrent enrollment or instructor's permission.

An algebra-based introduction to physics sequence designed for science majors who do not require calculus-based physics. Also suitable for general education students with no prior physics background; covers classical mechanics. Trigonometric requirement will be taught in the class. Three hours lecture and three hours laboratory per week.

PHY 111 Algebra-based Physics II (4)

Prerequisite: PHY 110 or equivalent course.

Second course in the algebra-based introduction to physics sequence designed for science majors who do not require calculus-based physics. Also suitable for general education student with no prior physics background; covers optics, electricity, and magnetism. Three hours lecture and three hours laboratory per week.

PHY 121 Calculus-based Physics I (4)

Prerequisite: MTH 191.

First of three calculus-based courses designed for the science and engineering major with no prior physics background; covers classical mechanics. Three hours lecture and three hours laboratory per week.

PHY 131 Calculus-based Physics II (4)
Prerequisite: PHY 121, or instructor's permission.
Second of three calculus-based courses designed for the science and engineering major; covers electricity, magnetism, and optics.
Three hours lecture and three hours laboratory per week.

Note: Organic chemistry courses recently changed back to their original 200-level Arizona Articulation numbers for ease of transfer. The 300-level designation was done several years ago for Navajo Nation Scholarship Office requirements for the BS Biology program.

- Include the program's pathways to transfer internally/externally or directly into a career.
  - Transfer internally within STEM is possible to other AS degrees but is designed particularly to transfer into the BS Biology program. The other BS degrees are also easy to transfer into with a few additional prerequisites.

C.2. Diné Identity and Program Uniqueness

- Provide a summary of how the Diné language is incorporated within the program curriculum.
  - This is required within the General Education program. It is also mentioned by faculty as they understand how it relates to the courses being taught. New faculty take DEP (Dine' Education Philosophy) courses on Friday's, as a requirement in their first few years, and optionally throughout their tenure.
- Provide a summary of how Diné history and culture are infused within content of the program curriculum:
  - As indicated above, this is required within the General Education and related to students according to the Instructor's background and understanding. Additionally, some Instructors have term papers and end-of-term presentations designed around a Dine' perspective related to the discipline of the course. For instance, students would choose to research and write about some aspect, of their choice, about Dine' perspectives of anatomy and physiology, general biology principles, genetics, chemistry, etc.. Students might be encouraged to interview family elders and Dine' medicine men or women to get this information. Students enjoy these activities and find them meaningful.

C.3. Instruction Method

- Schools should describe the instructional delivery methods used and whether the program is an interdisciplinary program. If so, then identify which other Schools are included. In addition, it should be noted whether this degree program, in its entirety, can be completed online or at an external campus.
  - This program can be completed only in person in Tsaile and most courses also are at other campuses in Tuba City and Shiprock. There are some online aspects to some courses, for instance some chemistry courses are delivered partially online, partially in person. Most or all labs are face to face. Lectures can be zoom in person but synchronous for off campus students, and recorded for asynchronous viewing. Homework can be online tutorial programs, like McGraw Hill's Connect programs, which are popular among faculty. Testing can also be done online through Connect with digital proctoring, or in person.
- Analysis of modality and student success. Schools should evaluate modalities and location of their courses and entire program. How many faculty are credentialed to teach online courses.
  - Most faculty are not credentialed to teach online. However, science courses with labs should not be taught online anyway. Answers to the other questions are elsewhere in this report.

C.4. Student Learning

- Please provide a brief summary of your program's student learning outcomes, assessment methods used to measure PSLOs and reason for selecting courses and artifacts. Include your program assessment report.

- AS Biology assessment webpage: (This is accessible to College personnel only, unfortunately) https://dinportal.jenzabarcloud.com/ICS/Faculty__Staff/Office_of_the_Provost/Office_of_Assessment/Degree_Program_Assessment/AS_Biology/

Program Student Learning Outcomes

PSLO#1---Students will be able to recognize and describe the relationships among structure, function, and processes at all biological levels.
PSLO#2---Students will be able to solve problems, apply appropriate scientific methodologies, and quantitatively interpret results through oral and written communication.
PSLO#3---Student will apply foundational content knowledge in the biological sciences to evaluate phenomena that occur in the natural world.
PSLO#4---Students will use and integrate biological themes into the Dine Way of Life; articulating their relationship and importance.
PSLO#5---Students will demonstrate ethical integrity, professionalism, and a commitment to learning.

This academic year, 2024-2025, Program faculty are assessing PSLO #1. The rubric applied to the designated artifact for BIO 181 and 182, the courses articulated with PSLO #1, which is a test/exam, will be
Met = 80-100% on Final Exam
Partially Met = 70-80%
Not Met = ≤ 69%
This assessment result will be calculated during Faculty Assessment Days, May 13-14.

Table 2. AS Biology Course Matrix

Program Outcomes for AS in Biology Majors	CHM130 General Chemistry	CHM151	BIO 181 General Biology I	BIO 182 General Biology II	Graduation
Outcome # 1: Students will be able to recognize and describe the relationships among structure, function, and processes at all biological levels. I K S					
Measure #1: Cellular Level			Art1		
Measure #2: Organismal Level				Art2	

Outcome #2: Students will be able solve problems, apply appropriate scientific methodologies, and quantitatively interpret results through oral and written communication. I K S					
Measure #1: Field Work				Art5	
Measure #2: Indoor lab	Art3	Art4	Art5		
Outcome #3: Students will apply foundational content knowledge in the biological sciences to evaluate phenomena that occur in the natural world. R S					
Measure #1: Describe human impacts on biological systems				Art6	
Outcome #4: Students will use and integrate biological themes into the Dine Way of Life; articulating their relationship and importance. R K S T					
Measure #1: Will use TEK to integrate Dine traditional knowledge with Western Scientific ways of knowing				Art7	
Outcome # 5: Students will demonstrate ethical integrity, professionalism, and a commitment to learning. R K S T					

Measure #1: Attendance & Class participation					Art[9]
Measure #2: Assignments…turned in?					Art[9]
Measure #3: Survey on confidence in their scientific knowledge					Art[8]

- [1] Test/Exam
- [2] Test/Exam
- [3] Lab Reports
- [4] Lab Reports
- [5] Lab Reports
- [6] Field sessions (Narrative) Reports & Testing
- [7] Interview elders and report on their views and understanding of biology topics
- [8] Indirect Survey
- [9] Instructor Survey

Note: Courses and their Artifacts are rated for the PSLOs as ***Introduced, Reinforced, Mastered, or Assessed*** as I, R, M, or A, respectively. Because all courses are Assessed in the Course Matrix, we assume A is applied to all PSLOs.

Note: Institutional Learning Outcomes (ILOs) are required to be indicated for each PSLO. Below are the ILOs. After each PSLO in the Matrix, the corresponding ILOs will be indicated by K for Knowledge, S for Skills, T for Tradition or L for Leadership.

Table 3. Institutional Learning Objectives.

Four Pillars			
Institutional Learning Outcomes (ILOs) (Experience over the course of the entire college experience)			
Knowledge	**Skills**	**Tradition**	**Leadership**
Natural & Physical Sciences	Critical thinking	Navajo Culture	Collaboration
Mathematics	Analytical Reasoning	Responsibility	Teamwork
Humanities	Reading Comprehension	Civic Engagement	Confidence
Social & Behavioral Science	Oral Communication Skills	Navajo Language	Global Perspectives
Fine Arts & Media	Written Comm. Skills	Inclusiveness	Capacity for Cont. Learning
Professionalism	Creative Thinking	Life Long Wellness	Maturity
Diverse/Global Cultures	Ethical Reasoning	Self-Reflection	Civic Engagement
Communicate Effectively	Professional Conduct	Navajo History	Social Responsibility
Technology Literacy	Research Skills		Integration of Learning
	Interpersonal Skills		Adaptability
	Planning/Organization		Application of Knowledge
	Quantitative Reasoning		

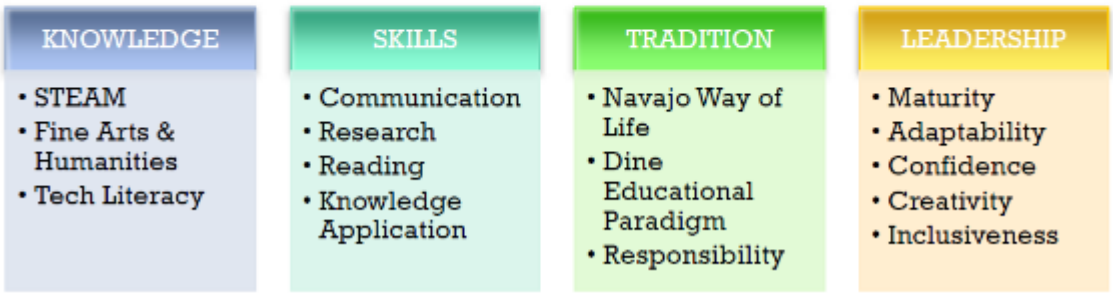

Table 4. Summary of AS Biology assessments/artifacts/outcomes, 2019-2022 (DPAR1) (full report in appendix)

Course	When Given	PSLO#/ Measure# P=PSLO m=measure	Artifact	Collected and Scored?		Met? Partially Met? Not Met?
CHM 130	Fall, Spring	P2/m2	Lab report	Yes		Met
CHM 151	Fall, Spring	P2/m2	Lab report	Yes		Met
BIO 181	Fall	P1/m1; P2/m2	Test/Exam; Lab report	Yes Yes		Met Met
BIO 182	Spring	P1/m2; P2/m1; P3/m1; P4/m1	Test/Exam; Lab report; Field Session Interview	Yes Yes Yes No		Not Met Met Met
Graduation	Spring	P5/m1	Instructor Survey	Yes		Met
Graduation	Spring	P5/m2	Instructor Survey	Yes		Met
Graduation	Spring	P5/m3	Student Survey	Yes		Met

D. **Program Faculty Profile**

This section of the review analyzes the program's faculty and provides an overview of faculty characteristics over a four-year period.

D.1. Faculty Profile over a four-year period.

Table 5: Overview of Program Faculty (see below for details)

There are no part time or Adjunct faculty. There are no BS-level faculty. There are 2 MS faculty and the rest are Ph.D.'s. There is only one Navajo faculty (Dr. Begaye). Salary range is unknown.

	2020-21	2021-22	2022-23	2023-24
Total Program Faculty/Instructors	**7**	**13**	**13**	**14**
Full-Time Faculty				
Education (PhD, MA, BA)				
Rank				
Adjunct Faculty				
Education (PhD, MA, BA)				
Rank				
Gender (Female/Male)	1/6	4/9	3/10	5/9
Race/Ethnic (Native/Non-Native)				
Salary Range				

Current faculty: all non-Native except Michael Begaye:

1. Karen Hannah Freedman, MS, (Tsaile since 2024) BIO 181 General Biology I, BIO 205 Microbiology
2. Shazia Hakim, Ph.D., (Tuba City since 2018) BIO 181 General Biology I, BIO 205 Microbiology, BIO 182 General Biology II
3. Partha Saha, Ph.D., (Shiprock since 2023) BIO 181 General Biology I, BIO 205 Microbiology, BIO 182 General Biology II
4. Shreeta Acharya, Ph.D. (Tsaile since 2024) CHM 130 Introductory General Chemistry, CHM 151 General Chemistry I, CHM 152 General Chemistry II, CHM 300 Introductory Organic Chemistry
5. Barb Klein, MS. (Tsaile since 2003) CHM 130 Introductory General Chemistry, CHM 151 General Chemistry I, CHM 152 General Chemistry II, CHM 300 Introductory Organic Chemistry
6. Babatunde Ojo, (Tuba City since 2018) Ph.D. CHM 130 Introductory General Chemistry, CHM 151 General Chemistry I, CHM 152 General Chemistry II, CHM 300 Introductory Organic Chemistry
7. Chengde Wang, (Tsaile since 2006) Ph.D. all MTH courses especially MTH 191 Calculus
8. Oleksandr Mekeyev, (Tsaile since 2014) Ph.D., all MTH courses especially MTH 213 Statistics

No longer with the College:

9. Michael Begaye, Ph.D., Navajo, (Shiprock) 2014 to 2023: CHM 130, 151, 152, 300
10. Paul Arbetan, Ph.D., (Tsaile) 2018 to 2025: BIO 182 General Biology II
11. Rajneesh Verma, Ph.D. (Tsaile) 2021 to 2023: all chemistry courses
12. Fred Boyd, Ph.D. (Tsaile) 2018 to 2022: BIO 181 General Biology I
13. Paul Prueitt, Ph.D., (Tsaile) 2021 to 2025: all MTH courses

D.2. Student/Faculty Ratio over a four-year period.

This section of the review shows the student to faculty ratio over a four-year period.

Table 6: Overview of Student to Faculty Ratio

	2020-21	2021-22	2022-23	2023-24
Average Student to Faculty Ratio	17:1	11:1	13:1	15:1

D.4. Full-time Faculty Management

- Describe full-time faculty support for college programs. How are full-time faculty mentored and supported? How is teaching performance of full-time faculty reviewed and how does the School respond to problems that are identified?
  - At Dine' College each faculty are observed in their course teaching by a peer faculty in the same discipline area during Spring semester. The Dean also evaluates the faculty in the Spring. Contracts are renewed in the Spring based on these two evaluations. Mentoring usually takes place informally by senior faculty in the discipline area of the faculty, then ongoing through collegial interaction with all other faculty.

D.5. Part-time Faculty Contribution and Evaluation

- How do the part-time faculty members contribute (may also include non-teaching) to the program? How are the part-time faculty evaluated?
  - We do not have any part time Instructors.

D.6. Reflection

- Overall, after reviewing various aspects of the faculty, what are the key findings? What are the strengths and opportunities to improve this area?
  - Strengths: students are happy with their classes and are successful with their degree program. Faculty enjoy the College and the School of STEM overall. Opportunities to improve: Faculty are always improving their teaching, their lab activities, their research involvement. There seems to be a consensus that not all faculty are "buddy-buddy" but we manage to get along enough, although it could be better through more collegial behavior towards each other.

E. Student Profile

This section of the review analyzes students of the program.

E.1. Student demographics over four-year period.

Table 7: Overview of Student Profile

	2020-21	2021-22	2022-23	2023-24
Full-Time & Part-Time Students – unduplicated, includes fall, spring and summer terms	28	27	37	52

First Time First Year Enrollees	4	1	10	7
Transfer Students	0	1	3	2
Pell Grant Recipient – at least one term	20	17	22	38
Gender = F/M	22/6	22/5	21/16	32/20
Race/Ethnic = Native/Non-Native	28/0	27/0	37/0	52/0
Age Range:				
13-17	0	0	0	1
18-21	3	8	18	30
22-24	16	14	7	10
25-34	7	3	10	6
35-49	2	2	2	4
50 & Older	0	0	0	1

E.2. Student by Chapter affiliation – Top 6 over a 4-year period

Table 8: Overview of Student by Chapter

Chapter	Total # of students enrolled
NULL – Student did not disclose/no data in J1	10
Tuba City	9
St. Michaels	8
Shiprock	5
Chinle	5
Tsaile/Wheatfields	5

F. **Student Engagement and Learning Opportunities**

F.1. Community Engagement

- Are there any community engagement activities between high schools, business communities, and community organizations with the department? How does the College support such community engagement activities for the students in this program?
    - Dr. Hakim has activities in Tuba City between her AS students and the local community and high schools.

F.2. High Impact Practices

- Identify the high impact practices that are incorporated into this program and its courses. High Impact practices refer to teaching and learning practices that have been shown to be beneficial for college students for student engagement and retention. High Impact practices may include experiences such as First Year Seminars, Writing Intensive Courses, Undergraduate Research, e-portfolios, Emphasis on Diversity/Global Learning, Service Learning, Community-Based Learning, Internships, Capstone Courses and Projects.\
    - Dine' College has a First Year Program but STEM is not directly involved. Our math placement program has been more successful lately, with higher percentages of graduates from all first year math courses. We have undergraduate research for sophomores and above. We have lab assistant positions for sophomores and above also. We have a summer research

internship for high achieving sophomores and above. The AS Biology program does not have a capstone course or project requirement. Most students pass the courses in the program to transfer into BS programs at Dine' College or other regional universities, or to get a job with their AS degree on the Reservation.

F.3. Co-curricular

i. Library Services

- How well does the Library meet the needs of the program? Describe the adequacy of the Library's holdings (e.g. databases, journals, books, and audiovisual materials). How do the collaborative information literacy instruction and reference/research assistance programs support the program being reviewed?
    - We have an excellent library with the largest selection of books and periodicals in the area. We have faculty-level expert librarians that assist students, Instructors and courses from freshman to graduate students. The library was remodeled in 2018 to increase study rooms and carrels.

ii. Student Success Services

- How well does student success services meet the needs of the program?
    - We have computer science, math, chemistry and English tutors available to our students through out Student Services. There are a lot of cultural and intellectual and artistic and entertainment presentations almost on a daily basis available to all students and the College community. Student Services provides a rich co-curricular variety of activities and services that seem to only increase and improve over time.

F.4. Course Satisfaction

- How satisfied are students with courses being offered?
    - Provide summarized course evaluations. These will have to be provided by the Dean and Provost
    - How has the department responded to issues raised to course satisfaction concerns via quantitative and qualitative assessments?
        - Only math has assessments like this, although the College Assessment Program for STEM programs, for the AS Biology program, summarized above, has found most courses meet the assessment criteria. There have been some new faculty that have had difficulty with student satisfaction, but faculty mentors and the Dean have been able to successfully negotiate the problems and train these faculty for improved Instructional outcomes.

F.5. Graduation Survey

- Summarize student responses in regards to career readiness, program satisfaction, services received and preparedness for transfer to another four-year institution.
    - As indicated in the 3-year Program Assessment Report above, the most recent Program Assessment PSLO #5 outcome was "Met" by students, which indicates their "ethical integrity, professionalism, and a commitment to learning. This was seen through three measures: Attendance and Class Participation (measure 1), Percent Assignments turned in (measure 2), and their "Confidence in their scientific knowledge" (measure 3).

G. **Resources**

G.1. Facilities

- Please describe the facilities that are used or associated with the degree program including but not limited to:
    - number of classrooms, science labs:
        - Tsaile: 4 lab classrooms, 2 for biology, 1 for chemistry, 1 for environmental science. Recently one of the biology rooms was made into

a research focus for biology, another was made into a molecular research focus. Student labs still take place to some extent in these two rooms. Faculty are using other non-lab classrooms for lecture so these two rooms were decided to be a biology research and lab-prep focus.
        - Shiprock has a biology and a chemistry classroom in a new Math Science building.
        - Tuba City has one science lab classroom and two small labs for research and training, one biology and one chemistry.
    - office space, faculty office space: We have one Administrative Assistant office in Tsaile, and all faculty in Tsaile, Tuba City and Shiprock have their own offices.
    - and digital databases for academic use, computer labs, conference rooms, and other equipment. We have a computer science lab classroom in Tsaile. There are several computer student learning centers, one at each campus. The College in Tsaile had a large auditorium until the Student Union fire, but also has a recently renovated large auditorium classroom in the Ned Hatathlie Center (NHC).
        - There are many labs at the College, three for the MS Biology program, run by Dr's Hakim, Makeyev, and Skaltsas.
- Please also indicate whether the School financially and physically maintains these specific resources.
    - The STEM School and the College are responsible for all of our faculties. It should be noted that indirect from grant money helps with this as well.

G.2. Operating Budget

- Provide a summary of the costs associated with the degree program. Indicate whether the cost to fund this program has increased over the years. This is not a financial audit, so in-depth descriptions of financial expenditures is not required. For example, indicate on average how much is spent annually on total faculty salaries, or operating costs, or co-curricular activities. DO NOT PROVIDE A DETAILED EXPENDITURE LIST.
    - Costs are from infrastructure maintenance such as utilities and repair, and also renovation in some cases of lab spaces requiring structures such as sinks, cabinets, tables, chairs, etc. Faculty and staff salaries are costs. Supplies and equipment for labs are paid for by grants as much as possible, but STEM College finances anything that is not related to grant objectives. Many faculty have research grants that are used in part for most of the kinds of these costs. Actual dollar amounts of these costs by category should be supplied by the College finance team.

A. Review

Provide a brief reflection of all areas of criteria and indicate areas of improvement.

No areas of improvement are indicated at this time. We look forward to group discussion during the APR, final recommendations, and the resulting 3-year Action Plan.

B. Results of the Site Visit
Attach/include the Site Visit Day Agenda and the APR Evaluation Team Documents.

Tentative:

9:00 to 10:30 AS Biology APR

Break

10:45 to 12:15 BA Biology APR

Lunch

1:00 to 2:00 Tour of Biology Lab-Classrooms, Dr. Skaltsas' lab, Dr. Makeyev's lab, Dr. Hakim's lab

2:00 to 3:30 MS Biology APR

C. External Reviewer – Feedback and Response
Provide details of the external reviewer's feedback. Please summarize the suggestions and recommendations put forth by the External Reviewer.

D. Three-Year Action Plan

***I and J are NOT part of the self-study, but included in the APR Final Report.