BACHELOR OF SCIENCE

IN

BIOLOGY

ACADEMIC PROGRAM REVIEW 2025

Partha S. Saha, Ph.D.

DINÉ COLLEGE

May 16th, 2025

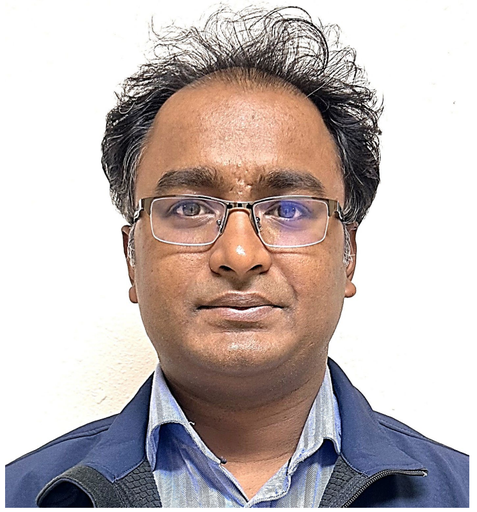
MEET OUR TEAM

James Tutt
Professor
School of STEM Dean

M.A., Western New Mexico University
B.S., Fort Lewis College

Don Robinson, Ph.D.
Associate Professor
Program Lead

Ph.D., M.S., Maharishi Int'l University
M.S., The University of Akron
B.S., Northern Arizona University



Partha S. Saha, Ph.D.
Assistant Professor
Biology Faculty

Post-doctorate, University of South Dakota
Ph.D., South Dakota State University
M.S., Katholieke Universiteit Leuven
M.S., University of Aberdeen
B.S., Noth South University

VISION & MISSION

01. Vision

Our vision is to improve continuously our programs and services to make Diné College the exemplary higher education institution for the Diné People.

02. Mission

Rooted in Diné language and culture, our mission is to advance quality post-secondary student learning and development to ensure the well-being of the Diné People.

Changes since the last APR

- **Checklist Updated**: Clearer structure and elective options added (Spring 2024)
- **BIO 499 Made Elective**: Based on faculty input and instructional feasibility
- **Assessment Focus**: Emphasis on Program Student Learning Outcome (PSLO) #1 and supporting student learning in difficult areas

> **PSLO 1:** “Students will be able to recognize and describe the evolutionary and developmental relationships among structure, function, and processes at all biological levels.”

DEGREE PROGRAM OVERVIEW

BS Biology program integrates Diné cultural philosophy with core biological training.

DEGREE PROGRAM OVERVIEW

Historical Background

- First graduates: May 2018

College Mission Alignment

- Rooted in Diné language and culture
- Incorporates Diné Educational Philosophy

Program Mission

- Covers core biological disciplines
- Prepares students for careers, graduate study, and service to the Navajo Nation

Program Goals

1. Master core biology
2. Integrate Diné and Western knowledge
3. Promote research and leadership
4. Address Navajo Nation's biological issues

Progress

- Curriculum meets College, HLC, and Navajo Nation requirements

CURRICULUM

2025 - 2026 Checklist

Bachelor of Science Degree

(120 credits)

COURSE NO. & TITLE	Credit	Transfer	Grade
GENERAL EDUCATION REQUIREMENTS (40-41 hrs)			
COMMUNICATIONS (6 hrs)			
ENG 101 College Composition I	3.0		
ENG 102 College Composition II	3.0		
HUMANITIES/FINE ARTS (6 hrs)			
Student must choose two courses with different prefixes from:			
ARH 110; ARH 211; CW 208; ENG 231; ENG 233; FA 106; FA 115; FA 178;			
HUM 152; LIB 110;			
	3.0		
	3.0		
MATHEMATICS (4.0 hrs based on major)			
or another MTH class as identified by degree program & std placement			
MTH 110 College Algebra	4.0		
NAVAJO STUDIES (9-10 hrs) One NAV course, determined by placement test			
NAV 101,102,201,202 or 211	3.0/4.0		
NIS 111 Foundations of Navajo Culture	3.0		
NIS 221 Navajo History to Present	3.0		
LABORATORY SCIENCES (9 hrs minimum)			
BIO 181 General Biology I	4.0		
CHM 151 General Chemistry I	5.0		

Lower Division Requirements (24 - 28 hrs)			
BIO 182 General Biology II	4.0		
CHM 152 General Chemistry II	4.0		
MTH 190 Pre-Calculus	4.0		
take one or more courses in this option group			
MTH 213/PSY 213 Statistics	4.0		
MTH 251 Calculus for Life Science and Business	4.0		
MTH 191 Calculus I	4.0		
take one of the 2 semester course sequence			
PHY 110 / PHY 111 Algebra-based Physics I & II	4.0/4.0		
PHY 121 / PHY 131 Calculus-based Physics I & II	4.0/4.0		
		Credits: 64-69 hrs	

UPPER DIVISION REQUIREMENTS (56-80 hrs)			
Junior Semester I:			
Required: BIO 326 Ecology	4.0		
Required: BIO 365 Writing in the Biological Sciences	3.0		
For the 2-semester organic sequence take CHM 301 this semester For the 1-semester organic course, take Optional Elect now, then CHM 230 in SPR			
CHM 235 General Organic Chemistry I	5.0		
Optional Elective crs:	3.0/4.0		
Take one or more Fall Biology Electives (list below)			
Biology Elective:	3.0/4.0		
Biology Elective:	3.0/4.0		
		13-20 hrs	
Junior Semester II:			
Required: BIO 370 Vertebrate Zoology	4.0		
Required: BIO 340 General Genetics	3.0		
If taking 1 sem organic minimum req'd take CHM 230, otherwise CHM 236			
CHM 230 Fundamental Organic Chemistry	4.0		
CHM 236 General Organic Chemistry II	4.0		
Take one or more Spring Biology Electives			
Biology Elective:	3.0/4.0		
Biology Elective:	3.0/4.0		
		15-20 hrs	
Senior Semester III:			
Required: CHM 360 Fundamental Biochemistry	3.0		
Required: BIO 344 Cellular and Molecular Biology	4.0		
Required: BIO 205 Microbiology	4.0		
Take one or more Fall Biology Electives			
Biology Elective:	3.0/4.0		
Biology Elective:	3.0/4.0		
		14-20 hrs	
Senior Semester IV:			
Required: BIO 435 Evolutionary Biology	3.0		
Required: BIO 498 Senior Seminar I	1.0		
Take one or more Spring Biology Electives			
Biology Elective:	3.0/4.0		
Biology Elective:	3.0/4.0		
Take one or more Optional Electives			
Optional Elective Crs:	3.0/4.0		
Optional Elective Crs:	3.0/4.0		
		14-20 hrs	
		Credits: 56-80 hrs	

DINE IDENTITY & PROGRAM UNIQUENESS

- **Rooted in Diné Philosophy**: Curriculum aligns with *Sa'ah Naagháí Bik'eh Hózhóón*—Thinking, Planning, Living, Reflection.
- **Cultural Integration**: Courses incorporate Diné language, history, and worldview alongside biological sciences.
- **Mission Alignment**: Supports Diné College's mission by advancing education for the well-being of the Navajo Nation.
- **Community Impact**: Prepares students to address local challenges and contribute to nation-building through science.

INSTRUCTION METHODS

- **Primary Mode**:
  Face-to-face lectures and laboratory instruction at the Tsaile campus.

- **Hybrid and Online Options**:
  Some courses offered in *hybrid format* (Canvas + in-person) and were fully online during the pandemic.

- **Campus Availability**:
  Currently taught at **Tsaile**, with potential to offer the full program at **Shiprock** and **Tuba City** campuses.

- **Interdisciplinary Approach**:
  Collaboration across STEM disciplines; curriculum reflects integration of science with Diné cultural frameworks.

ASSESSMENT OF STUDENT LEARNING OUTCOMES

- **5 PSLOs** assessed, focusing on biological knowledge, scientific inquiry, ecological understanding, Diné-Western integration, and student reflection.
- **Assessment tools**: Lab reports, essays, pre/post-tests, research papers, resumes.
- **Results**: Majority of assessed outcomes were *met* or *partially met*; some gaps due to faculty transitions and pandemic disruptions.
- **Improvements made**:
  - ✓ Revised degree checklist for clarity.
  - ✓ BIO 499 made elective.
  - ✓ Recommendation for an “Office of Assessment” to support consistent evaluation and instructional improvement.

PROGRAM FACULTY

The BS Biology program is led by highly qualified faculty, who integrate Western science and Diné knowledge.

PROGRAM FACULTY

- **Highly Qualified**: Majority hold Ph.D.s in biology, chemistry, and related fields
- **Thirteen Faculty (2023–24)**: Mix of full-time, adjunct, and dual credit instructors
- **Culturally Rooted**: Emphasize Diné knowledge alongside Western science
- **Student Support**: Teach, mentor research, and lead seminars
- **Regular Evaluation**: Annual reviews, professional development, and training in instructional tools

	2020-21	2021-22	2022-23	2023-24
Total Program Faculty/Instructors	**12**	**12**	**11**	**13**
Full-Time Faculty				
Education (PhD, MA, BA)				
Rank				
Adjunct Faculty				
Education (PhD, MA, BA)				
Rank				
Gender (Female/Male)	3/9	3/9	3/8	4/9
Race/Ethnic (Native/Non-Native)				
Salary Range				

	2020-21	2021-22	2022-23	2023-24
Average Student to Faculty Ratio	7:1	11:1	13:1	14:1

PROGRAM FACULTY PROFILE

- Maintained relatively stable faculty size over the years
- In 2023–24, the faculty gender ratio is 4 female to 9 male.

STUDENT TO FACULTY RATIO

- The student-to-faculty ratio has gradually increased over the past four years, reaching 14:1 in 2023–24.

REFLECTION ON FACULTY MANAGEMENT, CONTRIBUTION & EVALUATION

- **Post-Pandemic Shift**: Return to in-person teaching; on-site presence now mandatory
- **Online Instruction**: *Quality Matters* certification required
- **Faculty Development**: Ongoing workshops in soft skills and tools (e.g., Canvas LMS)
- **Performance Review**:
  - **Student Evaluations** each semester
  - **Annual Reviews** by Dean of STEM
  - **Issues addressed** through Dean, Provost, and HR
- **Professional Growth**:
  - **Employee Development Supplement Questionnaire (EDSQ)** required pre-training
  - **Trip Reports** document partnerships from conferences and workshops

STUDENT PROFILE

Based on the data, the program primarily serves Native American women aged 22–49, most of whom receive Pell Grants.

STUDENT PROFILE OVERVIEW

- **Enrollment Decline**: 67 → 47 students
- **Demographics**: Majority Native American, Female, Ages 22–49
- **Support**: 70%+ received Pell Grants

	2020-21	2021-22	2022-23	2023-24
Full-Time & Part-Time Students – unduplicated, includes fall, spring and summer terms	67	57	45	47
First Time First Year Enrollees	4	1	0	1
Transfer Students	0	0	1	3
Pell Grant Recipient – at least one term	45	41	32	33
Gender = F/M	53/14	43/14	35/10	37/10
Race/Ethnic = Native/Non-Native	64/3	55/2	44/1	46/1
Age Range:				
13-17	0	0	0	0
18-21	8	3	3	3
22-24	14	15	12	12
25-34	24	22	17	16
35-49	17	13	9	12
50 & Older	4	4	4	4

Chapter	Total # of students enrolled
Chinle	13
Tuba City	11
NULL – student did not disclose/no data in J1	9
Fort Defiance	9
Tsaile/Wheatfields	8

STUDENT ENGAGEMENT & LEARNING OPPORTUNITIES

Students gain real-world experience through research, culturally grounded coursework, and high-impact learning in writing, seminars, and community-based projects.

COMMUNITY ENGAGEMENT

- **Diné Environmental Institute (DEI)**
  - Established with Navajo Nation Council support
  - Focused on research and outreach aligned with Diné College's mission
- **CONVOY Project (2023–2028, NIH-funded)**
  - Merges Diné knowledge with biomedical science
  - College students mentor youth via labs, science cafés, and public health fairs
- **NARCH Partnership (with NAU)**
  - Involves high school and undergrad students in health research
  - Strengthens the biomedical pipeline within the Navajo Nation
- **Land Grant Office Initiatives**
  - Hosts youth-focused programs: environmental camps, gardening, and livestock workshops
- **NIFA-USDA-TCRGP Internship**
  - Trains students in water reuse and sustainability; supports food sovereignty through hands-on research.

HIGH IMPACT PRACTICES

- **Intensive Writing Course (BIO 365)**
  - Develops scientific writing and communication skills
  - Focus on research review papers in student-chosen topics
- **Capstone Seminars**
  - *BIO 498 Senior Seminar*: Encourages academic reflection and integration
  - *BIO 499 Contemporary Developments*: Explores real-world biology issues on the Navajo Nation and beyond
- **Undergraduate Research (BIO 485)**
  - Faculty-mentored research projects with credit
  - Available during academic year and summer

CO-CURRICULAR

- **Extensive Resources**:
  - Access to databases: PubMed, Medline, CINAHL Plus, Native Health Database
  - Holdings include books and audiovisual materials
- **Research Support Tools**:
  - Citation tools: Zotero, EasyBib, Citation Machine
  - Writing guides: Diné College Writing Handbook, APA & MLA style guides
- **Academic Support**:
  - Resources directly supplement assignments, research projects, and classroom learning

COURSE SATISFACTION & GRADUATION SURVEY

- **Evaluation Access**:
  - Course evaluations are not automatically shared; faculty must request them from OIPR.
- **Oversight**:
  - The Dean of STEM supervises faculty and addresses student complaints.
- **Response to Concerns**:
  - While formal data is not public, faculty confirm that Dean James Tutt actively follows up on issues to improve teaching and learning.

PROGRAM RESOURCES

Modern labs, dedicated faculty spaces, and campus-wide tech access ensure strong instructional and research support, fully maintained by the School.

FACILITIES

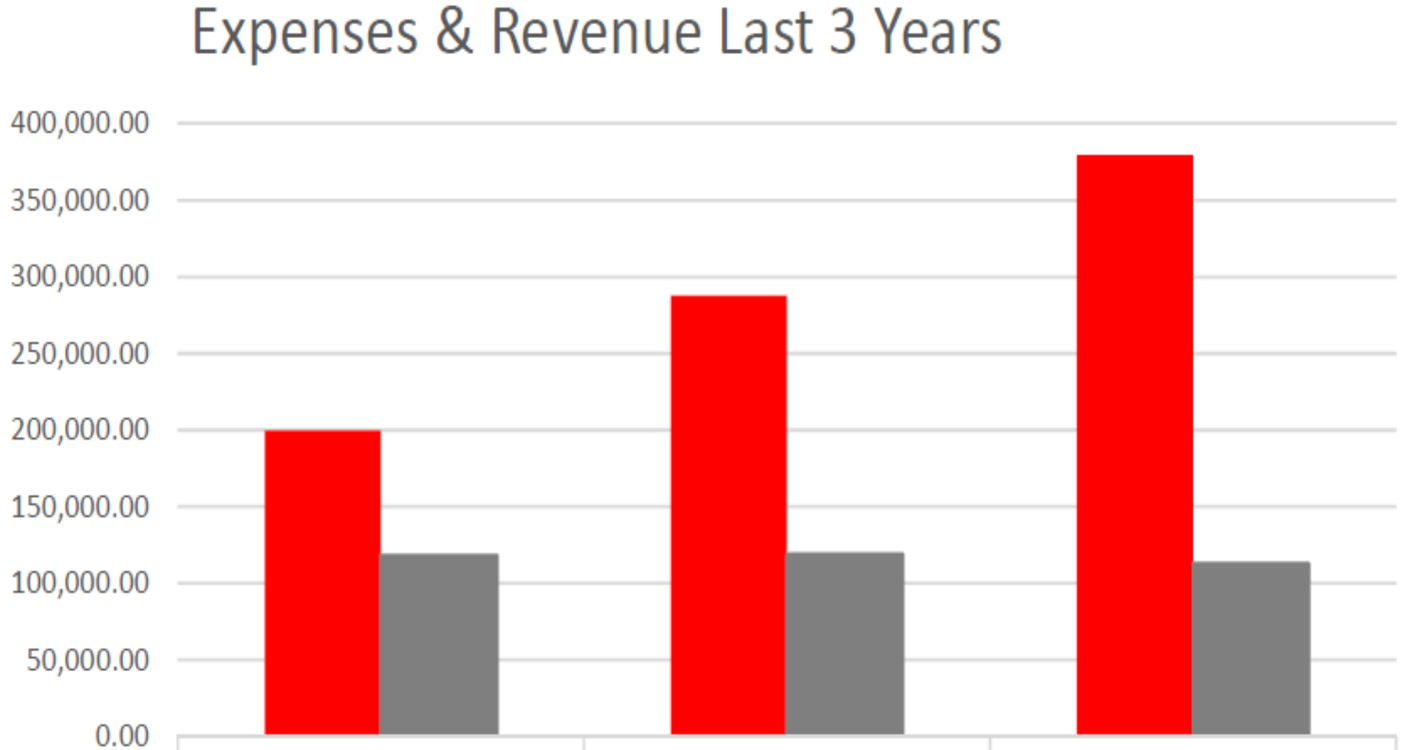
❑ Facilities– BS Biology

- **Campus Facilities**
  - **Tsaile**: 3 science labs, 3 research labs, 8 faculty offices, several computer labs
  - **Shiprock**: 2 science classrooms, 2 faculty offices, student computer lab
  - **Tuba City**: 1 lab classroom, 2 research trailers, 2 faculty offices
- **Support Infrastructure**
  - Classrooms and labs are fully equipped for instruction
  - Facilities maintained both physically and financially by the School
- **Office & Research Space**
  - Available for staff, faculty, and research use across all sites
- **Tuba City Facility Support**
  - Hosts a greenhouse for experimental activities and a computer lab for student use.

OPERATING BUDGET: Financial Performance Overview (2018–2021)

- **Key Financial Trends**
  - Expenses ↑: Grew from $199K (2018-19) to $379K (2020-21)
  - Revenue ↓: Declined from $118K to $113K
  - Net Loss: Widened from -$81K to -$266K

- **ROI Efficiency**
  - Revenue-to-Expense Ratio: 0.59 → 0.30

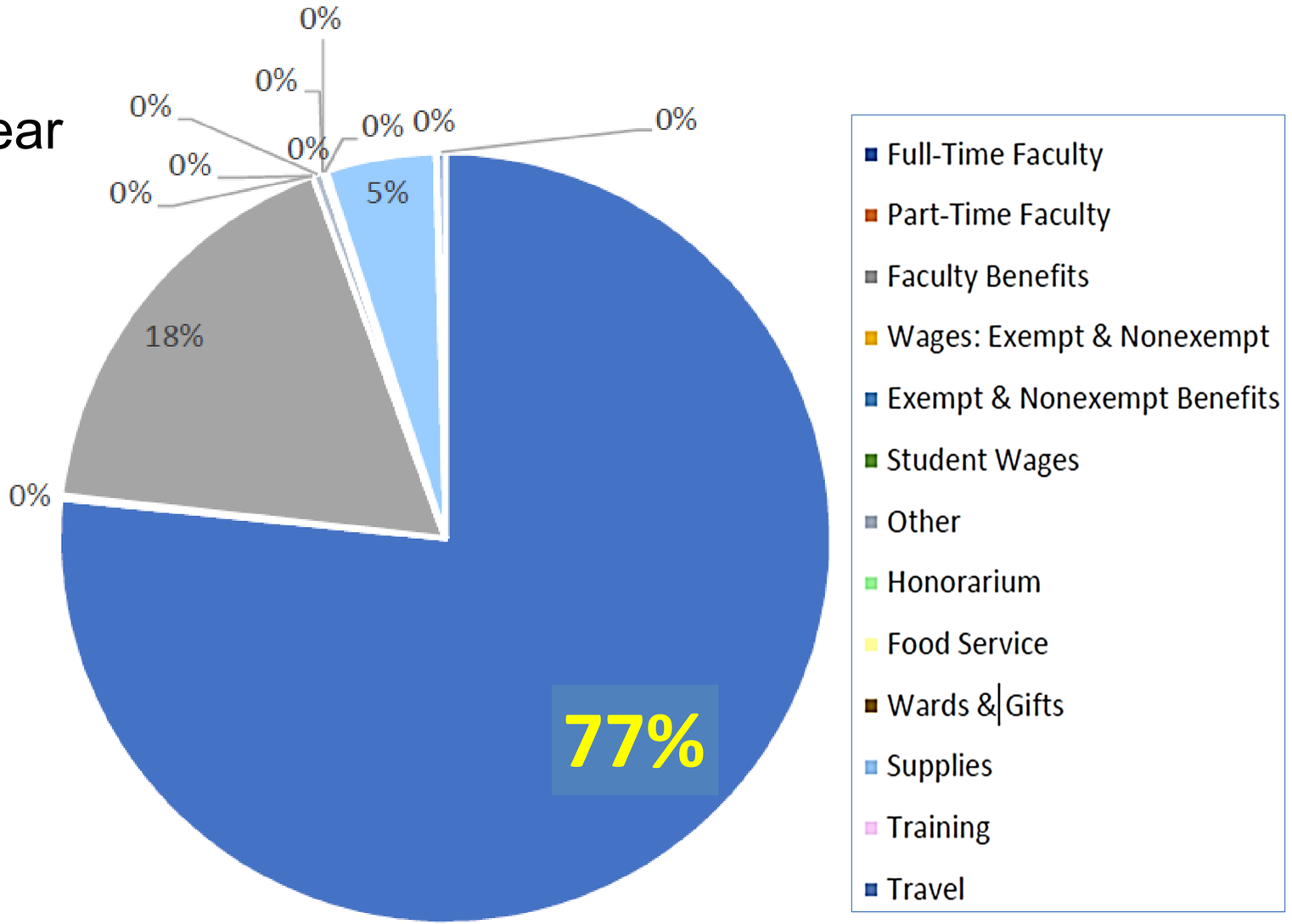


	2018-19	2019-20	2020-21
Total Estimated Expenses	199,636.46	287,459.40	379,031.49
Total Estimated Revenue	118,085.00	119,185.00	112,915.00

OPERATING BUDGET: Cost Drivers & Enrollment Trends

- **Primary Expense Area**
  - Full-Time Faculty = 77% of 3-year average expenses
- **Enrollment & Revenue Input**
  - Student Credit Hours: 2,147 → 2,053
  - Tuition Rate: Constant at $55
- **Slight drop in enrollments, no increase in revenue per student**

❖ **Insight:** Rising costs, flat tuition, and declining enrollment are undermining ROI.



THANK YOU!

Questions?