California State University, Fresno

College of Science & Mathematics

Biology Department

Biology BS Degree

Department/Program Assessment Coordinator [i]:

Associate Chair

Student Outcomes Assessment Plan (SOAP)

I. Mission Statement

The mission of the Department of Biology is to provide a diverse undergraduate program that matches the breadth of modern biology, develops students' knowledge of core concepts and core competencies as identified by the *American Association for the Advancement of Science* for undergraduate biology education, and prepares students for career opportunities that use biology as a foundation. The Bachelor of Science (BS) curriculum provides the depth of coverage required to promote students' conceptual understanding of biological principles, core competencies, and practices.

To accomplish this mission, the department offers a learning environment for students planning careers as professional life scientists, as medical professionals, teachers, and for those requiring a basic life science background for other majors including students fulfilling their general education science requirements.

II. Goals and Student Learning Outcomes

Fresno State Institutional Learning Outcomes:

- ***Acquiring specialized knowledge*** as identified by program learning outcomes in their major field. Students will demonstrate expertise in a specialized area of study, including integration of ideas, methods, theory and practice. Graduate students will demonstrate further mastery of the field's theories, research methods, and approaches to inquiry. They will also show the ability to assess major contributions to the field, as well as expand on those contributions through empirical research or aesthetic exploration.
- ***Improving intellectual skills*** including critical thinking, effective oral and written communication, information literacy and quantitative reasoning. Students will demonstrate

fluency via application of these skills to everyday problems and complex challenges. Graduate students will hone these skills further, demonstrating coherent arguments, analysis, insight, creativity, and acumen as they address local, regional, and global issues in their respective fields of study.

- ***Applying knowledge*** by integrating theory, practice, and problem solving to address real world issues using both individual and team approaches. Students will apply their knowledge in a project, paper, exhibit, performance, or other appropriate demonstration that links knowledge and skills acquired at the university with those from other areas of their lives. Graduate students will integrate knowledge and skills from coursework, practicum, and research to address critical issues in their field and demonstrate advanced application of knowledge through a culminating experience that validates, challenges, and/or expands the profession's body of knowledge.

Biology BS Program Goals & Student Learning Outcomes

The goals of the Biology BS program are designed to prepare undergraduate students for careers in the life sciences. To contribute effectively to their discipline, life science professionals need to engage with information, including managing large, complex data sets, understanding and evaluating evidence; and drawing from knowledge of related disciplines (e.g., chemistry, physics, engineering, social sciences) to address societal challenges.

The Biology Department's expectations for student learning are based on the core concepts and core competencies of *Vision and Change*, as developed by the *American Association for the Advancement of Science* for undergraduate biology education.

Goal A: Students will develop a basic understanding of the core concepts of biology.

- **Outcome A1:** Students will demonstrate an understanding of biology in the context of the five core concepts of biology (evolution; structure and function; information flow, exchange, and storage; pathways and transformations of energy and matter; living systems from cellular to ecological systems are interconnected and interacting).
- **Outcome A2:** Students will apply core concepts of biology to solve problems in laboratories.

Goal B: Students will apply the process of science. Students will understand that biology is evidence-based and grounded in the formal practices of observation, experimentation, and hypothesis testing.

- **Outcome B1:** Students will identify and apply the scientific methods of observation, experimentation, hypothesis formulation, and hypothesis testing.
- **Outcome B2:** Students will obtain, critique and apply primary scientific information (e.g., publication; dataset) and information resources (e.g., WebMD, Wikipedia).

Goal C: Students will use quantitative tools and methods to analyze data. Students should understand that biology often relies on applications of quantitative analysis and mathematical reasoning. Developing the ability to apply quantitative skills to biological problems should be required of all undergraduates, as they interpret and act on quantitative data from a variety of sources.

- **Outcome C1:** Students will interpret quantitative data (e.g., developing and using graphs; performing statistical analysis; bioinformatics) to address biological phenomena or problems, and/or use quantitative approaches to discover properties (e.g., patterns) in biological systems.

Goal D: Students will use mathematical or theoretical modeling or simulations to predict outcomes. Students should understand how mathematical or theoretical models and simulations describe living systems. In this way, students should experience how biological systems are dynamic, interactive, and complex, whether at the molecular, cellular, organismal, or ecosystem level.

- **Outcome D1:** Students will explain the advantages and limitations of modeling and computational approaches to study biological systems, and/or use modeling or simulation tools to examine a biological system (e.g., Punnett squares; protein folding).

Goal E: Students will understand the interdisciplinary nature of Biology. Students should have experience applying/integrating concepts from multiple subdisciplines of science to interpret biological phenomena.

- **Outcome E1:** Students will analyze concepts by combining examples, facts, and theories from more than one scientific field of study (e.g. understanding structural features or processes from a molecular point of view using chemistry).

Goal F: Students will communicate science. Students should have experience communicating biological concepts and interpretations through a variety of formal and informal written, visual, and oral methods.

- **Outcome F1:** Students will communicate science in written and/or oral forms.

Goal G: Students will understand the relationship between science and society. Students will explore science in a social context through real-life examples to explore the effect of science and technology on human society..

- **Outcome G1:** Students will communicate and ethically apply biological principles and global perspectives to current issues in human society and/or evaluate the impact of scientific discoveries on society (e.g., HeLa cells, stem cells).

III. Curriculum Map

The following curriculum map matrix connects Biology core courses and student learning outcomes.

I = Introduced **E=Emphasized or Reinforced** **M=Mastered**

	SLO	BIOL 1A & 1AL	BIOL 1B & 1BL	BIOL 101	BIOL 102	BIOL 103	BIOL 105
GOAL A	A1	I	I	R	R	R	M
	A2	I	I	-	-	-	-
GOAL B	B1	I	I	R	-	R	-
	B2	I	I	R	-	R	M
GOAL C	C	I	I	R	R	-	M
GOAL D	D	I	I	R	R	-	R
GOAL E	E	I	-	R	R	-	-
GOAL F	F	I	I	-	R	R	M
GOAL G	G	I	-	I	R	-	-

SLO's Mapped to Assessment Measures and Methods [e]

SLO	Direct Measures					Indirect Measures	
	Exam	Lab Report	Poster	Term Paper	HW/Exam Questions	Student Survey	Alumni Survey
A1	X					X	X
A2		X				X	X
B1		X				X	X
B2			X			X	X
C					X	X	X
D					X	X	X

E					**X**	**X**	**X**
F				**X**		**X**	**X**
G					**X**	**X**	**X**

IV. Assessment Measures

The following section describes all assignments and evaluation methods that the Biology Department will use to assess student learning in alignment with the identified SLOs above. We have included 5 direct measures and 2 indirect measures. Full copies of assessment and rubrics are included as appendices when noted.

Direct Measures

1. **Core Concept Exam** - To assess SLO A1, we will administer a multiple choice exam on the core concepts from our guiding framework, *Vision & Change*. This assessment was created with input from all core course instructors and includes comprehensive, summative questions that students should be able to correctly answer by the end of the program. We will administer this exam in both BIOL 1A (first core class) at the beginning of the semester and BIOL 105 (last core class) at the end of the semester. While not a clean pre/post measure, administering this to students at the beginning and end of their program can provide helpful insights about growth over time and potentially provide areas of improvement. For the full exam, see Appendix A. Students who score above 70% are considered proficient.
2. **Laboratory Reports** - To assess SLO A2 and B1, we will analyze laboratory reports from both Introductory Biology classes (BIOL 1A and 1B). For both classes, students are tasked with conducting a comprehensive scientific investigation and communicating their process and findings in a written laboratory report. While the focus of each investigation varies based on the course content, the requirements for the laboratory report are very similar. Both assignments require students to include an appropriate title, abstract, introduction that connects to past scientific literature, thorough description of methods and results, as well as a discussion of the significance of their work. APA formatting is required. In a given academic year, we will assess BIOL 1A in the Fall and BIOL 1B in the Spring. See Appendix B for the BIOL 1A and BIOL 1B assignments and rubric. The rubrics will be used by core instructors to assess student learning. Students who score above 70% are considered proficient.
3. **Scientific Poster** - To assess SLO B2, we will analyze digital scientific posters created by students enrolled in BIOL 103. This assignment is designed for students to investigate primary scientific literature and use that information to effectively communicate their understanding of genetics and molecular cell biology course content. Students are assessed based on their ability to convey primary scientific literature accurately in the format of a scientific poster. See Appendix C for the BIOL 103 poster assignment and rubric. The rubric will be used by the core

instructor to assess student learning. Students who score above 70% are considered proficient.

4. **Written Term Paper** - To assess SLO F, we will analyze term papers written by students in BIOL 105. This assignment is designed for students to synthesize a large body of knowledge about the course content of evolution and to present their understanding in a comprehensible manner (i.e., science communication). Students are tasked with writing an in-depth and articulate paper that follows standard writing conventions and is free from grammatical errors. Students must use a minimum of nine references, with seven being recent peer-reviewed scientific articles. Students are assessed on the overall structure and flow of the paper, inclusion of primary literature and relevant tables or figures. See Appendix D for the BIOL 105 term paper assignment and rubric. The rubric will be used by the core instructor to assess student learning. Students who score above 70% are considered proficient.
5. **Homework or Exam Questions** - For the remaining SLOs, we will use appropriate homework or exam questions from core courses to assess student learning. Specifically, we will use questions from BIOL 105 to assess SLO C, BIOL 101 to assess SLO D, and BIOL 102 to assess SLOs E and G; see Appendix E for all exam questions. Descriptive statistics for relevant exam questions will be reported. Students who score above 70% are considered proficient.

Indirect Measures

1. **Current Student Survey** - We will administer a periodic survey to current students majoring in Biology. The survey includes questions about student engagement and perceptions of their learning, experiences in the major, advising, overall satisfaction, future career plans, and optional demographic information. Results from this survey will be analyzed to guide future efforts to improve the experience of Biology BS students. Additionally, for students who share demographic information, we will analyze responses for potential differences based on student groups (e.g., gender, ethnicity, transfer students) to ensure our department is supporting all students in their academic pursuits of Biology and meet campus requirements for prioritizing Justice, Equity, Diversity, and Inclusion (JEDI). See Appendix F for the survey.
2. **Alumni Survey** - We will administer a periodic alumni survey to better assess how the Biology major at Fresno State has prepared students for their careers after graduation. The survey includes questions asking alumni about their current career and professional affiliations, as well as prompts them to reflect on how well the Biology BS program at Fresno State prepared them for that career. It also includes several open-ended questions to elicit their reflections about memorable learning experiences and any potential suggestions for program improvement. Finally, the survey asks if/how alumni would like to engage with the department in the future (e.g., speaking at a seminar, offering student internships, speaking on a career panel). This information will be used to guide future efforts to improve the program for students and potentially increase alumni engagement. See Appendix G for the survey.

Assessment Schedule/Timeline [g]

Assessment Methods	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33
SLO Assessed	**A**	**B&F**	**C&D**	**E&G**	**A**	**B&F**	**C&D**	**E&G**
1. Core Concept Exam	**X**				**X**			
2. Laboratory Report (Fall - 1A; Spring - 1B)	**X**				**X**			
3. Poster Presentation (103)		**X**				**X**		
4. Term Paper (105)		**X**				**X**		
5. Core Class HW or Exam Questions (101, 102, 105)			**X2** C: 105 D: 101	**X2** E: 102 G: 102			**X2** C: 105 D: 101	**X2** E: 102 G: 102
6. Current Student Survey			**X**				**X**	
7. Alumni Survey				**X**				**X**

- **Closing the Loop [h,j,k]**

Fresno State Closing the Loop process is described immediately below.

In the Department of Biology, the Associate Chair serves as the primary Assessment Coordinator with the assistance of the standing Assessment Committee (comprising 2-3 additional faculty members). The Associate Chair and Assessment Committee are responsible for carrying out assessment activities as described in this SOAP with the help of the entire faculty as needed. Additionally, they are responsible for reporting the results of the assessment to the university each academic year and suggesting program changes as needed. Assessment data and suggested program changes are presented to the entire faculty during a standing faculty meeting. The entire faculty then discusses the assessment results and decides whether to implement any suggested program changes.

APPENDIX A

Clean Copy - Core Concept Exam.pdf

APPENDIX B

BIOL 1A & 1B Laboratory Reports & Rubric

BIOL1A_LabReport_Instructions.pdf

BIOL1A_LabReport_Rubric.pdf

BIOL1B_LabReport_Instructions.pdf

BIOL1B_LabReport_Rubric.pdf

APPENDIX C

BIOL 103 Scientific Poster & Rubric

BIOL103_DigitalPoster_Instructions.pdf

BIOL103_DigitalPoster_Rubric.pdf

APPENDIX D

BIOL 105 Written Term Paper & Rubric

BIOL105_TermPaper_Instructions&Rubric.pdf

APPENDIX E

BIOL105_ExamQuestions_SLOc.pdf

BIOL101_ExamQuestions_SLOd.pdf

BIOL102_ExamQuestions_SLOe&g.pdf

APPENDIX F

Current Student Survey

Start of Block: Introduction

Q1 What is your campus ID number?

_____

Q2 What is your current class standing at Fresno State?

- ○ Freshmen (fewer than 30 units) (1)
- ○ Sophomore (completed 30-59 units) (2)
- ○ Junior (completed 60-89 units) (3)
- ○ Senior (completed 90 or more units) (4)

Q3 Are you a transfer student?

- ○ Yes (1)
- ○ No (2)

Q4 How many semesters have you attended Fresno State?

_____

Q5 How many semesters have you been a Biology major at Fresno State?

_____

Q6 Please select which of the following core classes you have completed within the Biology major at Fresno State so far.

- ▢ BIOL 1A (1)
- ▢ BIOL 1B (2)
- ▢ BIOL 101 (3)
- ▢ BIOL 102 (4)
- ▢ BIOL 103 (5)
- ▢ BIOL 105 (6)

End of Block: Introduction

Start of Block: Biology Major Specific

Q7 Were the following factors important to you in deciding on your major? Please select all that apply.

- ▢ Intellectual curiosity (1)
- ▢ Prepares me for graduate/professional school (2)
- ▢ Leads to a job (3)
- ▢ Prepares me for a career (4)
- ▢ Parental/family desires (5)

- Prestige (6)
- Could not get into my first choice major (7)
- Other; please describe. (8) _____

Q8 Thinking back over your coursework in the Biology major, how often were you required to do the following?

	Never (1)	Rarely (2)	Occasionally (3)	Somewhat Often (4)	Often (5)	Very Often (6)
Recall facts, terms, or concepts (1)	○	○	○	○	○	○
Explain methods, ideas, or concepts (2)	○	○	○	○	○	○
Use facts and examples to support your viewpoint (3)	○	○	○	○	○	○
Analyze relationships among ideas or concepts (4)	○	○	○	○	○	○
Incorporate ideas or concepts from different courses (5)	○	○	○	○	○	○
Judge the quality of information, ideas, or conclusions (6)	○	○	○	○	○	○
Create or generate new ideas, products, or ways of understanding (7)	○	○	○	○	○	○
Reconsider your own position on a topic after assessing the arguments of others (8)	○	○	○	○	○	○

Q9 Please answer the following questions about your educational experiences within the Biology major. How often have you experienced the following?

	Never (1)	Rarely (2)	Occasionally (3)	Somewhat Often (4)	Often (5)	Very Often (6)	N/A - No courses taken (7)

Faculty being open to discuss student needs, concerns, and suggestions (1)	○	○	○	○	○	○	○
Students treated fairly by the faculty (based on grading and exam policies) (2)	○	○	○	○	○	○	○
Faculty providing useful feedback on student work (3)	○	○	○	○	○	○	○
Faculty maintaining respectful interactions in classes (4)	○	○	○	○	○	○	○
Opportunities for active participation in classes (5)	○	○	○	○	○	○	○
Having an instructor who increases your enthusiasm for the subject (6)	○	○	○	○	○	○	○

End of Block: Biology Major Specific

Start of Block: Student Engagement

Q10 During this academic year, how often have you done the following in your Biology major courses?

	Never (1)	Rarely (2)	Occasionally (3)	Somewhat Often (4)	Often (5)	Vey Often (6)
Contributed to a class discussion (1)	○	○	○	○	○	○
Made a class presentation (2)	○	○	○	○	○	○
Found your courses so interesting that you did more work than was required (3)	○	○	○	○	○	○

Had a class in which the professor knew or learned your name (4)	○	○	○	○	○	○
Sought academic help from an instructor or tutor when needed (5)	○	○	○	○	○	○
Studied with a group of classmates outside of class time (6)	○	○	○	○	○	○

Q11 On average, how many of your assignments have you completed in your major courses this academic year?

- ○ 0-20% (1)
- ○ 21-40% (2)
- ○ 41-60% (3)
- ○ 61-80% (4)
- ○ 81-100% (5)

Q12 Which of the following activities, experiences or programs are you currently doing or have completed as a Biology major?

- ▢ Joined a student club (1)
- ▢ Participated in Course-Based Undergraduate Research (CURE) (2)
- ▢ Participated in an independent study with a faculty member (e.g., BIOL 190) (3)
- ▢ Smittcamp Honors Program (4)
- ▢ Biology Honors Program (5)
- ▢ CASA (6)
- ▢ BOND (7)
- ▢ Service-Learning or Community-Based Learning experiences in courses (8)
- ▢ Study abroad (9)
- ▢ Internship (10)
- ▢ Performing community service or volunteer activities (11)
- ▢ Other; please specify. (12) _____
- ▢ None of the above (13)

End of Block: Student Engagement

Start of Block: ARC Advising

Q13 Have you communicated with an advisor in the College of Science & Mathematics (CSM)'s Advising and Resource Center (ARC)?

- ○ No (1)
- ○ Yes (2)

End of Block: ARC Advising

Start of Block: ARC Advising Follow-up Questions

Q15 You indicated that you have communicated with an ARC advisor. How many times have you communicated with an ARC advisor?

_____

Q16 How satisfied were you with the level of advising you received from ARC?

- ○ Very dissatisfied (1)
- ○ Dissatisfied (2)
- ○ Somewhat dissatisfied (3)
- ○ Somewhat satisfied (4)
- ○ Satisfied (5)
- ○ Very satisfied (6)

Q17 Which topics did you discuss with an ARC advisor? Please select all that apply.

- ▢ Course selection (1)
- ▢ General Education (GE) requirements (2)
- ▢ Major exploration, selection, or changes (3)
- ▢ Academic plans (4)
- ▢ Tutoring or other resources to support my academic success (5)
- ▢ Activities related to my academic or intellectual interests (6)
- ▢ Opportunities to develop or apply skills (7)
- ▢ Graduate or professional studies (8)
- ▢ Careers and jobs (9)
- ▢ Issues related to the campus climate for diversity, equity, and inclusion (10)
- ▢ Personal or family challenges (11)
- ▢ Financial aid or other financial concerns (12)
- ▢ Other; please describe. (13) _____

End of Block: ARC Advising Follow-up Questions

Start of Block: Faculty Advising

Q18 Have you met with a Biology faculty advisor or a pre-professional advisor (e.g., pre-med, pre-dental, pre-vet)?

- ○ No (1)

○ Yes (2)

End of Block: Faculty Advising

Start of Block: Faculty Advising Follow-up Questions

Q19 You indicated that you have met with a faculty advisor. How many times have you met with a faculty advisor?

_____

Q20 How satisfied were you with the level of advising you received from a faculty advisor?

○ Very dissatisfied (1)

○ Dissatisfied (2)

○ Somewhat dissatisfied (3)

○ Somewhat satisfied (4)

○ Satisfied (5)

○ Very satisfied (6)

End of Block: Faculty Advising Follow-up Questions

Start of Block: Campus Climate

Q21 To what extent do you agree or disagree with the following statements?

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Somewhat Agree (4)	Agree (5)	Strongly Agree (6)
Fresno State is a welcoming campus. (1)	○	○	○	○	○	○
Overall, I feel comfortable with the climate of diversity and inclusion at Fresno State (2)	○	○	○	○	○	○
Overall, I feel comfortable with the climate of diversity and inclusion in my major. (3)	○	○	○	○	○	○

Overall, I feel comfortable with the climate of diversity and inclusion in my classes. (4)	○	○	○	○	○	○

End of Block: Campus Climate

Start of Block: Academic & Personal Development - Seniors Only

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q22 Please rate your level of proficiency in the following areas when you started as a Biology major at Fresno State and now.

	Very Poor (1)	Poor (2)	Fair (3)	Good (4)	Very Good (5)	Excellent (6)
Analytical and critical thinking skills - when you started (1)	○	○	○	○	○	○
Analytical and critical thinking skills - now (2)	○	○	○	○	○	○
Ability to be clear and effective when writing - when you started (3)	○	○	○	○	○	○
Ability to be clear and effective when writing - now (4)	○	○	○	○	○	○
Ability to read and comprehend scientific papers - when you started (5)	○	○	○	○	○	○
Ability to read and comprehend scientific papers - now (6)	○	○	○	○	○	○
Quantitative (mathematical and statistical skills) - when you started (7)	○	○	○	○	○	○

Quantitative (mathematical and statistical skills) - now (8)	○	○	○	○	○	○
Understanding your field of study (Biology) - when you started (9)	○	○	○	○	○	○
Understanding your field of study (Biology) - now (10)	○	○	○	○	○	○
Oral communication skills - when you started (11)	○	○	○	○	○	○
Oral communication skills - now (12)	○	○	○	○	○	○
Leadership skills - when you started (13)	○	○	○	○	○	○
Leadership skills - now (14)	○	○	○	○	○	○
Library and online information research skills (e.g., finding books, articles, evaluating information sources) - when you started (15)	○	○	○	○	○	○
Library and online information research skills (e.g., finding books, articles, evaluating information sources) - now (16)	○	○	○	○	○	○

End of Block: Academic & Personal Development - Seniors Only

Start of Block: Overall Satisfaction - Seniors Only

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q23 Overall, rate your satisfaction with the Biology major at Fresno State.

- ○ Very dissatisfied (1)
- ○ Dissatisfied (2)
- ○ Somewhat dissatisfied (3)
- ○ Somewhat satisfied (4)
- ○ Satisfied (5)
- ○ Very satisfied (6)

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q24 Overall, how likely are you to recommend the Biology major to another student?

- ○ Very unlikely (1)
- ○ Unlikely (2)
- ○ Somewhat unlikely (3)
- ○ Somewhat likely (4)
- ○ Likely (5)
- ○ Very likely (6)

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q25 Thinking back on your time as a Biology major at Fresno State, what was the most meaningful learning experience?

_____

_____

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q26 Thinking back on your time as a Biology major at Fresno State, what did you find challenging?

_____

_____

Display this question:

If What is your current class standing at Fresno State? = Senior (completed 90 or more units)

Q27 What advice would you give a new student who is majoring in Biology?

_____

_____

End of Block: Overall Satisfaction - Seniors Only

Start of Block: Plans and Aspirations

Q28 What career do you hope to eventually have after you have completed your education?

- ○ Health care (Doctor, vet, etc.) (1)
- ○ Education (2)
- ○ Environmental management and conservation (3)
- ○ Research (4)
- ○ Agriculture (5)
- ○ Biotechnology (6)
- ○ Biomathematics (7)
- ○ Bioinformatics (8)
- ○ Forensic science (9)
- ○ Politics and policy (10)
- ○ Business and industry (11)
- ○ Economics (12)
- ○ Science writing and communication (13)
- ○ Scientific illustration (Art) (14)
- ○ I have no idea at this point (15)
- ○ Other; please describe. (16) _____

Q29 Which of the following best represents your primary plans right after graduation?

- ○ Enroll in professional school (1)
- ○ Enroll in graduate school (2)
- ○ Work part or full time (3)
- ○ Be self-employed or start my own company (4)
- ○ Study or work abroad (5)
- ○ Serve in the armed forces (6)
- ○ Do an internship (7)
- ○ Take a year off (8)
- ○ I have no idea at this point. (9)
- ○ Other; please describe. (10) _____

Q30 What is the highest academic degree or credential that you eventually plan to earn?

- ○ Bachelor's degree (B.A., B.S.) (1)
- ○ Teaching credential (2)
- ○ Business master's (M.B.A.) (3)
- ○ Other professional master's (M.Ed., MPP, MPH, MFA, MLIS, MSN, MSW, etc.) (4)
- ○ Academic master's (M.A., M.S.) (5)

- ○ Law degree (L.L.B., J.D., etc.) (6)
- ○ Medical doctorate other than M.D. (e.g., O.D., D.D.S, D.V.M., etc.) (7)
- ○ Medical doctor (M.D.) (8)
- ○ Doctorate (Ph.D., Ed.D., etc.) (9)
- ○ Multiple doctoral degrees (M.D./Ph.D.) (10)
- ○ I do not know yet (11)
- ○ Other; please specify. (12) _____

End of Block: Plans and Aspirations

Start of Block: Demographics

Q31 Are you a first generation college student?

- ○ No (1)
- ○ Yes (2)
- ○ Prefer not to answer (3)

Q32 Which of the following best describes your annual family income when you were growing up?

- ○ Annual family income over $200,000 (1)
- ○ Annual family income of $100,000 - $199,999 (2)
- ○ Annual family income of $50,000 - $99,999 (3)
- ○ Annual family income of $20,000 - $49,999 (4)
- ○ Annual family income below $19,999 (5)
- ○ Prefer not to answer (6)

Q33 What is your gender identity?

- ○ Man (1)
- ○ Woman (2)
- ○ Nonbinary (3)
- ○ Prefer to self-describe (4) _____
- ○ Prefer not to answer (5)

Q34 What is your ethnicity?

- ○ American Indian or Alaska Native (1)
- ○ Asian (2)
- ○ Black or African American (3)
- ○ Hispanic or Latino (4)
- ○ Native Hawaiian or Other Pacific Islander (5)
- ○ White (6)
- ○ Two or more races (7)
- ○ Prefer not to answer (8)

Q35 Do you have any conditions or disabilities that significantly affect your experience as a Biology major at Fresno State, including how you learn or perform academically, interact with others, or access campus? Select all that apply.

- ▢ I do not have any disabilities or conditions (1)
- ▢ Physical disability or condition (e.g., mobility limitation, sensory condition) (2)
- ▢ Learning disability or condition (e.g., dyslexia, speech disorder) (3)
- ▢ Neurodevelopmental/cognitive disability or condition (e.g. ,autism, attention-deficit/hyperactivity disorder, brain injury) (4)
- ▢ Emotional or mental health concern (e.g., depression, anxiety, post-traumatic stress disorder) (5)
- ▢ Chronic health condition (e.g., cancer, diabetes, arthritis, sickle cell anemia) (6)
- ▢ Other disability or condition; please specify (7)

  _____

- ▢ Prefer not to answer (8)

End of Block: Demographics

APPENDIX G

Alumni Survey

Start of Block: Introduction

Q1 What is your name?

_____

Q2 What is your preferred permanent email address? Keep in mind, your Fresno State email address is deactivated shortly after graduating.

_____

Q3 What year did you graduate from Fresno State with a Biology degree?

_____

Q4 Are you currently employed?

- ○ No (1)
- ○ Yes (2)

Display this question:

If Are you currently employed? = Yes

Q5 You indicated you are currently employed. Where are you employed? What is your current position?

_____

_____

Q6 Please list any other groups or networks that you have affiliated with since graduating from Fresno State (e.g., community groups, non-profit organizations).

_____

_____

Q7 Did you obtain additional education following your bachelor's degree?

- ○ No (1)
- ○ Yes (2)

Display this question:

If Did you obtain additional education following your bachelor's degree? = Yes

Q8 You indicated you obtained additional education after completing your bachelor's degree. Please list your additional degree(s), the institution(s), and what year(s) they were earned.

_____

End of Block: Introduction

Start of Block: Biology BS Reflection

Q9 How well did your biology degree prepare you for your career?

- ○ Not well at all (1)
- ○ Slightly well (2)
- ○ Moderately well (3)
- ○ Very well (4)
- ○ Extremely well (5)

Q10 How useful was your biology degree for developing the following skills? Check all that apply.

- ▢ Oral communication (1)
- ▢ Written communication (2)
- ▢ Critical thinking and problem-solving (3)
- ▢ Adaptability & flexibility (4)
- ▢ Attention to detail (5)
- ▢ Time management and organization (6)
- ▢ Leadership and initiative (7)
- ▢ Ethical awareness and responsibility (8)
- ▢ Data analysis and interpretation (9)
- ▢ Networking and professionalism (10)
- ▢ Laboratory techniques (11)
- ▢ Information literacy (12)
- ▢ Other; please specify. (13) _____

End of Block: Biology BS Reflection

Start of Block: Block 2

Q11 Reflecting back on your time as a Biology major at Fresno State, please share any specific experiences that were especially enjoyable, interesting, or memorable? Briefly describe the experience and why you listed it here.

_____

_____

Q12 Reflecting back on your time as a Biology major at Fresno State, please share any specific challenges that you encountered that negatively impacted your academic success or experience. Briefly describe the challenge and any feedback you have to alleviate this challenge for future students.

_____

_____

Q13 We are looking for ways to increase alumni engagement within the program. Please select any of the following opportunities that you are interested in receiving more information about in the future.

- ▢ Giving a seminar or talk at our department colloquium about your current work (1)
- ▢ Speaking on a career panel for current students (2)
- ▢ Serving as a mentor for a current student with similar career interests (3)
- ▢ Providing internships for Fresno State students or graduates (4)
- ▢ Social networking events with faculty and students (5)
- ▢ Other; please describe. (6) _____
- ▢ None of the above (7)

End of Block: Block 2

Start of Block: Optional Demographics

Q14 What is your ethnicity?

- ○ American Indian or Alaska Native (1)
- ○ Asian (2)
- ○ Black or African American (3)
- ○ Hispanic or Latino (4)
- ○ Native Hawaiian or Other Pacific Islander (5)
- ○ White (6)
- ○ Two or more races (7)
- ○ Prefer not to answer (8)

Q15 What is your gender identity?

- ○ Man (1)
- ○ Women (2)
- ○ Non-binary (3)
- ○ Prefer to self-describe. (4) _____
- ○ Prefer not to answer (5)

Q16 Which of the following best describes your annual family income when you were growing up?

- ○ Annual family income over $200,000 (1)
- ○ Annual family income of $100,000 - $199,999 (2)
- ○ Annual family income of $50,000 - $99,999 (3)
- ○ Annual family income of $20,000 - $49,999 (4)
- ○ Annual family income below $19,999 (5)
- ○ Prefer not to answer (6)

Q17 Which of the following best describes your annual family income now?

- ○ Annual family income over $200,000 (1)
- ○ Annual family income of $100,000 - $199,999 (2)

- ○ Annual family income of $50,000 - $99,999 (3)
- ○ Annual family income of $20,000 - $49,999 (4)
- ○ Annual family income below $19,999 (5)
- ○ Prefer not to answer (6)

Q18 Do you identify as having any of the following conditions or disabilities? Select all that apply.

- ▢ I do not have any disabilities or conditions (1)
- ▢ Physical disability or condition (e.g., mobility limitation, sensory condition) (2)
- ▢ Learning disability or condition (e.g., dyslexia, speech disorder) (3)
- ▢ Neurodevelopmental/cognitive disability or condition (e.g. ,autism, attention-deficit/hyperactivity disorder, brain injury) (4)
- ▢ Emotional or mental health concern (e.g., depression, anxiety, post-traumatic stress disorder) (5)
- ▢ Chronic health condition (e.g., cancer, diabetes, arthritis, sickle cell anemia) (6)
- ▢ Chronic health condition (e.g., cancer, diabetes, arthritis, sickle cell anemia) (7)
- ▢ Other disability or condition; please specify. (8)

_____

- ▢ Prefer not to answer (9)

End of Block: Optional Demographics