



ANNUAL PROGRAM REPORT

Academic Program	Sciences and Mathematics
Reporting for Academic Year	2019 - 2020
Department Chair	Cynthia S. Trevisan
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1. SELF-STUDY (about 1 page)

A. Five-year Review Planning Goals and B. Goals Progress

Since our last Program Review (2013), our program achieved the following goals: The chemistry program replaced its *Chemistry I* class with two specialized chemistry classes: *Introductory Chemistry*, and *General Chemistry*. It also created a new course for Oceanography majors: *General Chemistry 2 lecture and laboratory (CHE210/210L)* to be offered beginning spring 2021. A new course (Introductory Biochemistry) is also in development.

A math minor was created, which included the development of the following new classes: Introduction to *Linear Algebra*, *Complex Analysis*, and *Probability and Statistics*, and *Introduction to Partial Differential Equations*, and *Quantum Mechanics*. With the hire of Dr. Setniker, a redesign of our department's introductory math curriculum was launched. This includes the coordination and redevelopment of our College Algebra and Trigonometry (MTH 100) course, the creation of a MTH 100 Student Workbook, the creation of common final exam questions, the coordination of different MTH 100 instructors, and the mentoring of undergraduate teaching assistants.

One new class was created in the physics program: *Physics for Future Leaders*. No progress was made towards creating a minor in physics. A new physics course and laboratory were created for Oceanography majors: *General Physics II* and *General Physics II Lab*, to be offered starting in spring 2021.

The following five classes were created in the marine sciences program (now referred to as Oceanography): *Marine Microbial Ecology*, *Physical Oceanography*, *Chemical Oceanography*, *Introduction to Remote Sensing*, and *Phycology*. Additionally, Dr. Alejandro Cifuentes-Lorenzen redesigned COM210L as "Oceanography Computer Programming Laboratory". This newly repurposed lab will compliment ENG 210/ COM210. New courses in Chemistry, Physics, and English were created to support the Oceanography curriculum.

Oceanography faculty and students participated in a NOAA National Marine Fisheries Service Southwest Fisheries Science Center oceanographic survey during June 2019 and although we were scheduled to participate in June 2020, we ultimately decided not to participate due to COVID-19. We intend to participate in June 2021 if health conditions permit.

During fall 2019 Oceanography faculty developed a plan to build and deploy an oceanographic buoy in the San Francisco Estuary, to be sited in San Pablo Bay. Approximately \$55,000 was committed to the project. During spring 2020 the project team, led by Drs. Cifuentes-Lorenzen and Randolph, purchased much of the hardware. The project completion date is currently scheduled for Fall 2021.

Supplemental instruction sessions were established for several classes in chemistry, physics and mathematics. Tenure-track faculty members in all programs (with the exception of computer sciences) have engaged undergraduate students in research projects at an individual level.

C. Program Changes and Needs

Tenure-track faculty changes since our last review follow in all programs:

- 2019 – Dr. Ariel Setniker, Assistant Professor, Hired
- 2019 – Dr. Nelson Coates, Assistant Professor, Resigned
- 2018 – Dr. Alejandro Cifuentes-Lorenzen, Assistant Professor, Hired
- 2018 – Dr. Abigail Higgins, Assistant Professor, Resigned
- 2017 – Dr. Abigail Higgins, Assistant Professor, Hired
- 2016 – Dr. Matthew Fairbanks, Assistant Professor, Hired
- 2015 – Dr. Julie Simons, Assistant Professor, Hired
- 2015 – Dr. Ryan Smith, Assistant Professor, Resigned
- 2014 – Dr. Ryan Smith, Assistant Professor, Hired
- 2014 – Dr. Nelson Coates, Assistant Professor, Hired
- 2014 – Dr. James Wheeler, Professor, Retired
- 2013 – Dr. Alex Parker, Assistant Professor, Hired
- 2013 – Mr. Lloyd Kitazono, Professor, Retired

Changes and needs in the marine science program:

As we prepared to launch the new Oceanography degree, we have continued to work with Dr. Jennifer Murphy as an adjunct professor. Dr. Murphy has several years of undergraduate teaching of oceanography and her expertise in geochemical oceanography compliments the existing expertise in our department. Dr. Murphy served as a sabbatical replacement for Alex Parker in Fall 2019 and continued to teach oceanography and chemistry in spring 2020. She will teach as a full-time lecturer in fall 2020, teaching oceanography as well as chemistry lecture and laboratory.

Changes and needs in the chemistry program:

A second semester of general chemistry (CHE210/210L) has been created. Currently, the lab space available is sufficient to support one section of CHE210L along with existing sections of CHE110L and CHE105L, though additional budgetary support is needed for additional

chemicals and supplies. If enrollment increases in the Oceanography program offering more sections of CHE210L, new lab space and equipment may be required.

Changes and needs in the mathematics program:

A minor in mathematics was created (see previous section). Three Provost Curriculum Redesign grants were awarded to faculty members teaching mathematics in our Department. One of the grants was used to design a recitation/lab model class as a co-requisite to our entry-level math course, College Algebra and Trigonometry. This approach was taken to help under-prepared incoming students and to comply with Executive Order 1110 (EO 1110). EO 1110 requires campuses to eliminate remedial mathematics and English courses that do not offer college credits to students. Another grant produced worksheets that incorporate active learning techniques in class activities for Calculus I. The third grant was used to establish the curricula for a cross-disciplinary project that links activities between an Elementary Statistics course and a Critical Thinking course.

Changes and needs in the physics and computer science program:

As our student population increases and these programs develop new offerings, faculty hires and lab equipment will be needed.

Need for all programs: student graders to help alleviate the high grading workload of professors and benefit students by providing earlier feedback on performance.

2. SUMMARY OF ASSESSMENT (about 1 page)

A. Program Student Learning Outcomes

Sciences – Student Learning Outcomes (SSLO)

1. Understand scientific principles and their relationship to the physical universe. (IWSLO-B, D)
2. Use theories, principles and models, in conjunction with the scientific method to analyze problems in science. (IWSLO-B, C, D)
3. Acquire and utilize mathematical and computational techniques to both analyze and comprehend problems in science. (IWSLO-B, C, D, G)
4. Effectively communicate scientific information in a way that is meaningful and convincing (IWSLO-A, F)

Mathematics – Student Learning Outcomes (MSLO)

1. Apply mathematical techniques and reasoning to problems in math. (IWSLO-C)
2. Create mathematical expressions from a word or application problem and analyze those expressions applying mathematical principles. (IWSLO-B, C)
3. Demonstrate an understanding of the theoretical and practical aspects of solving problems in math. (IWSLO-B, D)

B. Program Student Learning Outcome(s) Assessed

During the 2019-2020 academic year, formal assessment of MSLO-1, 2 & 3 and SSLO-3 were conducted.

C. Summary of Assessment Process

Department SLOs are assessed at the course level. Instructors gather assessment artifacts and apply an assessment rubric developed by the instructors and the department. Each instructor summarizes assessment results in a formal assessment report that is collected by the department chair. Assessment reports and data can be found in the department OneDrive assessment folder.

D. Summary of Assessment Results

Currently, not all instructors have submitted reports for all courses during the 2019-2020 academic year which does not necessarily reflect a lack of assessment for all courses. Due to the incomplete record of assessment, it is difficult to interpret general trends for the results. Results are summarized in the following table. Values represent the percentage of students achieving 4 or better on a 6-point rubric.

COURSE	term	SSLO-3	MSLO-1	MSLO-2	MSLO-3
CHE110	FA19	81.4			
COM100	FA19	84			
MTH100	FA19		73.7		
MTH210	FA19		79.5	72.4	
MTH250	FA19				
PHY205	FA19	14.8			
CHE105	SP20	50			
CHE105	SP20	91.6			
CHE205	SP20	91.7			
MTH107	SP20			59	
MTH215	SP20			78	
MTH210	SP20		91.3	52.4	64
PHY205	SP20	38.1			

Given the lack of assessment data this academic year, more effort needs to be made to streamline data collection via our Learning Management System. This will require additional training for all faculty in the use of the assessment tools available in the new system.

3. STATISTICAL DATA

Statistical data is meant to enhance and support program development decisions. These statistics will be attached to the Annual Report of the Program Unit. This statistical document will contain the same data as required for the five-year review including student demographics of majors, faculty and academic allocation, and course data.

NOTE: The data that follows corresponds to the fall of 2018. The collection of data for academic year 2019 – 2020 was hampered due to diversion of resources during the COVID-19 pandemic.

<i>Program</i>	2018
A. Students	
1. Undergraduate	NA (no majors offered)
2. Postbaccalaureate	NA (no majors offered)
B. Degrees Awarded	
NA (no majors offered)	
C. Faculty	
Tenured/Track Headcount	
(fall 2017)	
1. Full-Time	10
2. Part-Time	0
3a. Total Tenure Track	10
3b. % Tenure Track	67
Lecturer Headcount	
(fall 2017)	
4. Full-Time (lecturers with WTUs ≥ 15)	3
5. Part-Time	2
6a. Total Non-Tenure Track	5
6b. % Non-Tenure Track	33
7. Grand Total All Faculty	15
Instructional FTE Faculty (FTEF)	
(fall 2017)	
8. Tenured/Track FTEF	7.88
9. Lecturer FTEF	4.20
10. Total Instructional FTEF	12.08
Lecturer Teaching	
(fall 2017)	
11a. FTES Taught by Tenure/Track	127.27
11b. % of FTES Taught by Tenure/Track	63.4
12a. FTES Taught by Lecturer	73.47
12b. % of FTES Taught by Lecturer	36.6
13. Total FTES taught	200.73
14. Total SCU taught	3,011
D. Student Faculty Ratios	
1. Tenured/Track	16.2
2. Lecturer	17.5
3. SFR By Level (All Faculty)	
4. Lower Division	16.8
5. Upper Division	15.3
E. Section Size	
1. Number of Sections Offered	57
2. Average Section Size	19.2
3. Average Section Size for LD	19.6
4. Average Section Size for UD	15.4
6. LD Section taught by Tenured/Track	30
7. UD Section taught by Tenured/Track	5
8. GD Section taught by Tenured/Track	0
9. LD Section taught by Lecturer	22
10. UD Section taught by Lecturer	0