

Crafton Hills College - Outcomes Assessment Report

General Education Outcome: Natural Science

Assessed: 2021-2022

Learning Outcomes Statement

Students successfully completing a course in this area will be able to apply a problem solving strategy such as the scientific method or other systematic process of inquiry and to recognize the contributions of science and technology in our world.

Means of Assessment (Measurement Method)

Students were assessed during either the Fall 2021, Spring 2022, or Summer 2022 semesters. Assessments occurred in 444 sections and resulted in a total of 7,272 assessments.

Summary of Evidence

Table 1: Number and Percent of students scoring 3 or Higher on the GEO.

GEO #	General Education Outcome	# 3 or higher	% 3 or higher
1	Students successfully completing a course in this area will be able to apply a problem solving strategy such as the scientific method or other systematic process of inquiry and to recognize the contributions of science and technology in our world.	5,832	80.20%

List of courses where outcomes were mapped to the GEO (46 Unique Courses).

ACCT-209		
ANAT-101		
ANAT-150		
ANAT-151		
ASTRON-150		
ASTRON-160		
BIOL-100		
BIOL-130		
BIOL-130H		

BIOL-131		
BIOL-131H		
CHEM-101		
CHEM-102		
CHEM-123		
CHEM-150		
CHEM-151		
CHEM-212		
CHEM-213		
COMMST-100		
CSCI-120		
CSCI-200		
CSCI-230		
CSCI-240		
EMS-150		
GEOG-110		
GEOG-111		
GEOL-100		
GEOL-101		
GEOL-150		
GEOL-150H		
GEOL-160		
GEOL-181		
GEOL-246A		
GEOL-246B		
GEOL-270		
HIST-100		
HIST-100H		
MATH-102		
MICRO-150		
OCEAN-101		
PHYSIC-100		
PHYSIC-110		
PHYSIC-111		
PHYSIC-250		
PHYSIC-251		
PHYSIC-252		

Use of Results/Proposed Actions – Individual Submissions

1	The ANAT program will continue to provide unbiased high-quality instructions and work with students' diversities to ensure that the target goals are met. The lead faculty members will continue to work with and provide support to all adjunct faculty in this program.
2	Additional instructional resources and ideas for online Lab content. Being fully online for this course, it would be helpful to see what resources other online instructors are using to help their students through the online Lab content. An instructor only Canvas shell or other online site where instructors could pool their ideas and online resources would be very helpful.
3	<p>After meeting with [NAME] and [NAME], two conclusions are clear:</p> <ul style="list-style-type: none"> - over the past 4 years the SLOs have been successfully met, however, - these SLOs were crafted by my predecessor, L. Shimeld, and are relatively repetitive <p>Actions:</p> <ul style="list-style-type: none"> - New SLOs must be crafted and simplified - SLOs should focus on areas where improvement can be observed - this is largely observed in the laboratory - Labs previously omitted by my predecessor (Antiseptics, sanitation, Selectivity and enterotubes, etc) are landmarks in transition into healthcare, these should be reintroduced and evaluated. <p>Interests:</p> <p>Based on preparation of students for the first 2 lecture exams, students are often (self-reporting) coming unprepared (untrained) in subjects like general biology, general chemistry, organic chemistry, and physiology, which are essential in Microbiology - A new form of assessment to evaluate previous preparation in both lecture in lab should be introduced.</p>
4	<p>After meeting with [NAME] and [NAME], two conclusions are clear:</p> <ul style="list-style-type: none"> - over the past 4 years the SLOs have been successfully met, however, - these SLOs were crafted by my predecessor, L. Shimeld, and are relatively repetitive <p>Actions:</p> <ul style="list-style-type: none"> - New SLOs must be crafted and simplified - SLOs should focus on areas where improvement can be observed - this is largely observed in the laboratory - Labs previously omitted by my predecessor (Antiseptics, sanitation, Selectivity and enterotubes, etc) are landmarks in transition into healthcare, these should be reintroduced and evaluated. <p>Interests:</p>

	Based on preparation of students for the first 2 lecture exams, students are often (self-reporting) coming unprepared (untrained) in subjects like general biology, general chemistry, organic chemistry, and physiology, which are essential in Microbiology - A new form of assessment to evaluate previous preparation in both lecture in lab should be introduced.
5	All targets met, proposed actions to continue to monitor students progress to see what can help them be successful. Each term I ask for course feedback on how to make the course better and I take all feedback into consideration for the following term.
6	All the above SLO statements were met in my class, although the above results might not show it since four students in this class have stopped attending and participating in the class activities (due to personal reasons) but never dropped the class.
7	All the above SLO statements were met in my class.
8	Although this was a small class and online, only one student performed to the target. The other students had attendance issues, and at least one needed some remedial tutoring.
9	As an online class, the students had to use virtual microscope activities to meet that SLO. Where this does help them understand the skills and parts of the microscope, many still did not feel confident in its use. To aide in this concern, I will research videos and other online media of scientists in active use of a microscope to help students further understand its use and abilities.
10	Both students are exceptional students.
11	Continue encouraging Mastering Chemistry assignments
12	Continue to do what is working
13	Continue to encourage mastering chemistry assignments, many students still not doing them despite extra credit being offered there
14	Continue to evaluate how students are doing through the course term to see if modifications are required.
15	Continue to monitor student progress during term, and make adjustments when necessary.
16	Continue to monitor student success and make adjustments when necessary.
17	Continue to work for success.
18	Continue with the curriculum. In this online/virtual environment, continue to utilize and explore new ways to reach at-home learners.
19	<p>Create a clear simple one page guide clarifying the distinctions between primary, secondary, and tertiary literature as a resource for students. Break the writing assignment into the smallest steps possible for a quick turn-around in peer reviews and instructor assessment.</p> <p>Some ESL, DSPPS, and other students would benefit from reading-and-writing level assessment and guidance before taking 100-level courses, and more institutional support during the course.</p>
20	Current teaching/learning approach seems to be working. Maintain detailed guideline resources for students.
21	Design an activity for Honors students in which each Honors student partners as a mentor for one or more at-risk students in the class during laboratory activities and writing draft work. Embed this partnership within a peer review process involving the entire class so that the at-risk students do not feel labeled as special needs.

22	During the pandemic, hands-on practice with laboratory tools was greatly condensed and limited. As we return to a more normal schedule, I plan to retain some activities that proved highly successful. Introducing a tool in one laboratory, using it again in a second lab meeting, and again at a more sophisticated level in a third activity builds student confidence and expertise.
23	Each student did well in this course this summer
24	Explain the importance of homework assignments in students' learning process.
25	Few students took both pre and post tests and results are not statistically relevant to take significant actions.
26	For SLO 2- This measurement was for one specific experiment, toward the first third of the class. In comparing to SLO #4 which is a measurement of all lab points, we see that students were able to improve their scores and demonstrate application of the material presented. Continue to monitor student success and make adjustments when necessary.
27	Great student. Met requirement.
28	<p>Had the students do a quiz weekly on each chapter worth 50 points this in addition to doing an history journal that included at least 6 paragraphs of pertinent information for each the chapter worth 10 points. This aided in study review for the 3 essay tests. The historical journal helped students with their online discussion board with their classmates. it was interesting to see the discussion referencing things I had seen in the historical journal and how they built on this for their essay exams.</p> <p>I was careful to have every module with dates and weekly assignments carefully organized. Each subset of the weekly module had detailed requirements dates and times whether for readings, videos and journals, discussions and tests.</p> <p>Too, I made a point of using students names in every response and offered detailed analysis of why and how they earned the grade they did so this supported the rubrics. The rubrics were carefully designed to make clear why and how each grade was earned.</p> <p>In addition, if I saw a students work drop off or there was inconsistent behavior I reached out to them and also noted grade and what extra credit they could do to add to or help a grade that dropped. Though this was an synchronous class we had time for class meetings on zoom every week plus if a student wanted to me at other times we did. As well as all these requirements honor's students had to do a research essay on one of the areas under study. This meant having a meeting with the librarian, learning how to use data bases and using the appropriate for writing format for history. There is a tendency in community colleges for students to only know how to use MLA format. Unfortunately that is a rather limited format and not needed for other disciplines.</p>
29	I believe I should institute some sort of group work in the areas that where less than 65%.
30	I would like to improve my SLO for statement 4
31	In person exams will help to see what the students are really learning. Exams in the online format are difficult to really evaluate the students knowledge as it is difficult to keep them from using notes or online resources. Some students are honest and do not use these resources but others are not. So, FALL 2022 we will have in person exams again and it will be a better indication of what the students know.
32	Incorporate more Geographic Information Systems projects during the semester.
33	Keep doing what we are doing!

34	Maintain current information sharing process and course content.
35	More students will succeed in future classes when they are in a chemistry lab rather than use an online chemistry laboratory simulator.
36	Need more hands on laboratory experience. This should be addressed in FALL 2022 as we return to in person labs
37	No proposed actions at this time.
38	Objectives were met.
39	One of the students that did not meet the target had a problem with attendance. Recommending better attendance will be done. Encouraging students to attend tutoring and SI will also be done.
40	On-line peer review continues to be overwhelming and less successful compared to in-person practices. If instruction of this type must be delivered online or remotely, review processes that help guide students to success may benefit from breaking up tasks into even smaller goals for intermediate assessment and feedback.
41	Perform smaller formative assessments throughout the course Include active learning activities during lecture
42	Plan to update assignment to include more current journal papers to review
43	Plan to update assignment to include more current journal papers to review. Attempt to get more students to complete assignments, maybe make them worth more points?
44	Prior implementation of student support to guide students to meet expectations for professional communication have increasingly been successful with the exception of ESL students. Partnerships with the Writing Center for targeted course-specific support for ESL students or any other student with writing skills barriers seem one potential avenue to pursue.
45	Several students failed to turn in the work required to meet the SLO.
46	SLO # 4 result does reflect the true result as two students did not do any assignment on Mastering Chemistry, and 9 students did only a few assignments. I'm planning on discussing the importance of the online assignments with my class not only to improve their grades in the class but also to better understand the course concepts.
47	SLO #4: This was an Applications project where students are to research a chosen organic compound and write up the project from an organic chemistry point of view. Many students did well, a few of them chose not to see me the numerous times I had available for me to guide them through the project, the class was remote and that put the student in charge of attending the Zoom session and to initiate questions. All instructions and a Rubric was posted in Canvas for students to view, but I feel like if this course was in-person and not remote, I would have been able to get to know the students better and make the point to encourage them and help guide them through this process.
48	Starting the semester online hindered student learning. Make the class face-to-face for the entire semester.
49	Statement #9 above was a typo and not an assessment.
50	Strengthen in-class writing guidance, practice, peer review processes, and additional support such as SI or other partnerships with the Tutoring Center / Writing Center to clarify expectations for clear communication of knowledge. Previous implementations have

	improved outcomes, but I would like to increase the number of students achieving learning outcomes at the 4 rather than 3 level.
51	Stronger math skills, teach note taking and effective studying, push tutoring center more, teach how to be a student and time management.
52	Student did an excellent job.
53	Student engagement and math skills needs improvement. *this section had 7 students who remained in class but did not participate in lecture, lab or assessment. these students were included in this data.
54	Student focus and math skills need to be addressed and assisted. better ways to encourage and push tutoring is being planned.
55	Students did a great job and met target.
56	Students did a great job with their field studies.
57	Students need more math knowledge and understanding before being able to solve problems. Tutoring and STEM center will be a big part of improving this need, as well as workshops and refresher videos.
58	Students need to be stronger in algebra and completed higher in math to success in number 2
59	Students successfully completed exams, quizzes, assignments, and projects during the summer session. This was due to their dedication to studying and the time spent in class review and discussions. To increase student success: - I will further develop topic discussions with students. - I will develop curriculum and application of information. - I will spend more time outside of class updating and increasing my knowledge to become more proficient.
60	Students will be more engaged and committed to the class in an in-person setting.
61	Target was not met. I can do more inquiry activities to try to improve student understanding.
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68	The hands on laboratory component was missing in the course which lead to the poorer results on laboratory equipment skills. When we are safe to have lab back in person, this should be enough to get the target met.
69	The lowest percent on all the SLO's is 75%, that is for the exams and homework administered through the online site MyLab/Mastering, this is an acceptable target for this class which has no prerequisites and is fully online.
70	The one student enrolled is an exceptional student.
71	The only student who did not meet the target had an attendance problem. I will continue to encourage students to attend class.
72	The student that did not meet the target had a difficult time with attendance. More encouragement should be done to ensure that students attend lab.
73	The students that did not meet the target failed to turn in the report to show that they knew what they were doing.
74	<p>this class had 6 "no show" students after the drop date passed. The 5 students that stayed in the class did not complete assignments.</p> <p>Proposed action would be to find a miracle way to inspire and motivate the students who simply do not care/can not care to study for the course.</p>
75	This class is a spatial study of the Earth's dynamic physical systems and processes. Physical Geography is important because once we learn and understand how our Earth works, we can figure out ways to use these processes for our benefit. In addition, we can figure out solutions to problems that will enhance our days here on this Earth.
76	<p>This class modality is remote in Zoom.</p> <p>Next term this class will be in person, and I will be able to monitor the students better, and also have opportunities to get to know them and encourage them in the course in person.</p>
77	<p>This is a fundamental SLO, "the ability to apply mathematics to chemical measurements". This Fall semester I created a math review, it was optional. So just a couple of students use it. I started with a full class, and lost 10 students by the end. Math reviews will get more emphasis next time.</p> <p>The SLO "the ability to do problems involving reaction stoichiometry" is essential for future chemistry classes. I think students could use a more discussion-based presentation of stoichiometry to clarify terminology.</p> <p>The SLO 'comprehension and use of laboratory skills in synthetic, quantitative and instrumental methods as scientific approaches to gathering and verifying knowledge" in my view is the SLO that had suffered the most by doing virtual labs instead of a face-to-face lab. Techniques such "titrations" had not been giving the needed justice due to the lack of hands on. In this area, I am looking forward to teaching the lab face-to-face.</p>

78	This is a very useful method of evaluating the effectiveness of the teaching strategies and communication between the teacher and students which should be continued since it helps the teacher adjust his/her teaching methods to better the learning outcome of the students.
79	<p>This semester I had 2 students cheat and plagiarizes all lab reports. One student did all the work, the other copied. This was discovered during the last weeks of the term, then all lab reports were carefully looked over. I scored 7 of the lab reports as zero since those were the reports with overwhelming evidence of cheating. The students were informed of the consequence and admitted to doing it. The amount of points needed to pass the course was no longer possible for these students to earn and they stopped participating in all course assignments and exams.</p> <p>This class modality is remote in Zoom. I had two other students that initially would attend the Zoom sessions, but they soon stopped actively participating in the course.</p> <p>Next term this class will be in person, and I will be able to monitor the students better, and also have opportunities to get to know them and encourage them in the course in person.</p>
80	This student enrolled in the lab by itself was exceptional.
81	This was a very small class. One of the students struggled all semester. With only one not meeting the criteria, the target could not be met.
82	This was a great class which met the target.
83	<p>To increase student success:</p> <ul style="list-style-type: none"> - I will spend more time with students outside of the scheduled time as part of my development plan. For example: study/review sessions. - I will continue to improve and build remote/online material. This can be done by reviewing current material and reflecting on student success and struggles from previous semesters. - Developing my overall curriculum will prepare students to problem solve and think critically. This can be completed by reviewing students exams to gauge the overall understanding of the class. <p>After meeting with Gio and Gwen, two conclusions are clear:</p> <ul style="list-style-type: none"> - over the past 4 years the SLOs have been successfully met, however, - these SLOs were crafted by my predecessor, L. Shimeld, and are relatively repetitive <p>Actions:</p> <ul style="list-style-type: none"> - New SLOs must be crafted and simplified - SLOs should focus on areas where improvement can be observed - this is largely observed in the laboratory

	<p>- Labs previously omitted by my predecessor (Antiseptics, sanitation, Selectivity and enterotubes, etc) are landmarks in transition into healthcare, these should be reintroduced and evaluated.</p> <p>Interests:</p> <p>Based on preparation of students for the first 2 lecture exams, students are often (self-reporting) coming unprepared (untrained) in subjects like general biology, general chemistry, organic chemistry, and physiology, which are essential in Microbiology - A new form of assessment to evaluate previous preparation in both lecture in lab should be introduced.</p>
84	<p>To increase student success:</p> <ul style="list-style-type: none"> - I will spend more time with students outside of the scheduled time as part of my development plan. For example: study/review sessions. - I will continue to improve and build remote/online material. This can be done by reviewing current material and reflecting on student success and struggles from previous semesters. - Developing my overall curriculum will prepare students to problem solve and think critically. This can be completed by reviewing students exams to gauge the overall understanding of the class. <p>After meeting with [NAME] and [NAME], two conclusions are clear:</p> <ul style="list-style-type: none"> - over the past 4 years the SLOs have been successfully met, however, - these SLOs were crafted by my predecessor, L. Shimeld, and are relatively repetitive <p>Actions:</p> <ul style="list-style-type: none"> - New SLOs must be crafted and simplified - SLOs should focus on areas where improvement can be observed - this is largely observed in the laboratory - Labs previously omitted by my predecessor (Antiseptics, sanitation, Selectivity and enterotubes, etc) are landmarks in transition into healthcare, these should be reintroduced and evaluated. <p>Interests:</p> <p>Based on preparation of students for the first 2 lecture exams, students are often (self-reporting) coming unprepared (untrained) in subjects like general biology, general chemistry, organic chemistry, and physiology, which are essential in Microbiology - A new</p>

	form of assessment to evaluate previous preparation in both lecture in lab should be introduced.
85	<p>To increase student success:</p> <ul style="list-style-type: none"> - I will spend more time with students on the project's outcomes, methods, and time frame for completion. - I will continue to improve remote/online lab mechanics. This can be done by reviewing current material and reflecting on student success and struggles from previous semesters. - This project incorporates information students learn during the semester. Developing my overall curriculum will prepare students to <p>problem solve and think critically when completing this project. This can be completed by reviewing student work to gauge the overall understanding of the class.</p>
86	Tutor
87	Two issues were encountered. Students felt since pre-test was not included in the overall grade, some of them opted to make quick guesses to move to the next assignment on Canvas. The post-test had a mistake in SLO 5 that I did not catch until after it was administered. Those who rationalized the correct answer and opted for the closest one, were given full credit. This mistake was corrected for future implementation. Students overall did better in other assessments in class including discussions, labs, homework and exams. Quizzes, such as these pre and post-tests do not seem to reflect student progress in this calc based physics class. Therefore, I think assessing SLOs for this class should consider reevaluating this method of assessment in future implementations.
88	Two students did not turn in the assignment, which was the primary reason for not meeting the target.
89	We need to continue having opportunities for students to write and speak so that they continue to practice the skill of formulating their ideas and thoughts. Synthesizing information is another area for continued focus.
90	Work on exam structure/content
91	<p>Work to develop more specific experimental design labs that focus more closely on data interpretation.</p> <p>SLO1 Assessment used: Evolution, Founding Theories and Principles</p> <p>SLO2 Assessment used: Experimental Design</p> <p>SLO3 Assessment used: Trophic Levels: Grazers and Consumers</p> <p>SLO4 Assessment used: Light Microscopy</p>