

CATEGORY	(1) Have formal learning outcomes been developed?	(2) Where are these learning outcomes published?	(3) Other than GPA, what data/evidence is used to determine that graduates have achieved stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)	(4) Who interprets the evidence? What is the process?	(5) How are the findings used?	(6) Date of last program review for this degree program
BIOLOGY						
<p>Yes:</p> <ol style="list-style-type: none"> Students will display an understanding of biological systems and evolutionary processes spanning all ranges of biological complexity including molecules, genes, cells, organisms, communities, and ecosystems. Students will be proficient at applying principles of the scientific method to problems in biology, including the formulation of a hypothesis, implementation of a research project, collection and analysis of data, and interpretation of data in both written and oral formats. Students will demonstrate preparedness for service and leadership in science related issues affecting society. 	Published on the Pepperdine website	<p>2015-2016 Direct Data</p> <ol style="list-style-type: none"> Midterm and Final exams <p>Indirect Data</p> <ol style="list-style-type: none"> Mid semester student surveys Pre-course tests <p>Authentic Assessment</p> <ol style="list-style-type: none"> Development and presentation of research proposal Field trips Guest speakers Senior exit, and alumni surveys 	<p>2015-2016 Biology faculty External Reviewer</p>	<p>2015-2016</p> <ol style="list-style-type: none"> Plan for Enhancement of Quantitative Methods and Problem-Solving Reconsideration of the Existing Biology Curriculum 	<p>Academic Year 2010 - 2011</p> <p>Next review 2022-2023</p>	
<p>2012</p> <ol style="list-style-type: none"> Students will display an understanding of biological systems and evolutionary processes spanning all ranges of biological complexity including molecules, genes, cells, organisms, communities, and ecosystems. Students will be proficient at applying principles of the scientific method to problems in biology, including the formulation of a hypothesis, implementation of a research project, collection and 		<ol style="list-style-type: none"> Senior Survey Student-directed research proposals, projects, and presentations 	Biology Faculty	<ol style="list-style-type: none"> Senior seminar (BIOL 491) is now a one unit course Plans to make BIOL 491 a two unit capstone course Plans to eliminate BIOL 110 and replace with BIOL 211 and 212 Plans to modify the current course in statistical analysis in a manner that emphasizes research design and 		

analysis of data, and interpretation of data in both written and oral formats.				statistical analysis of biological data.	
3. Students will demonstrate preparedness of students for service and leadership in science related issues affecting society					

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CHEMISTRY						
<p>Yes:</p> <ul style="list-style-type: none"> ● Critical Thinking and Problem Solving: Successfully solve and demonstrate to others multistep problems in Organic, Analytical, and a third sub-discipline of the field. In at least one case, critical evaluation of the quality or usefulness of the data presented must be evaluated and explained. ● Written and Oral Communication: Reports of independently obtained laboratory results and analysis must be presented in the scientific format. The effectiveness of presentation and the linguistic quality of the report will be evaluated. A seminar must be presented on a current or historical topic in chemistry in which all of the chemistry department community is invited to attend. The effectiveness and quality of presentation will be evaluated. ● Technical Skills: Each student in the major will be evaluated on their technical competence in the laboratory with respect to operating the chemical instrumentation and properly handling apparatuses specific to certain sub-disciplines. 	Published on the Pepperdine website	<p>2015-2016 Direct Data</p> <ol style="list-style-type: none"> 1. Laboratory Reports graded on a rubric 2. Manuscripts graded on a rubric <p>Indirect Data</p> <ol style="list-style-type: none"> 1. None <p>Authentic Assessment</p> <ol style="list-style-type: none"> 1. Journal Manuscripts written in either American Chemical Society or Elsevier manuscript format 	<p>2015-2016</p> <ul style="list-style-type: none"> ● David B. Green, Assessment Coordinator ● James B. White, Assessment of CHEM 430 and Assessment Reviewer ● Jane A. Ganske, Assessment Reviewer ● Joseph M. Fritsch, Assessment Reviewer ● Matt Joyner, Senior Writing Assessment and Assessment Reviewer 	<p>2015-2016</p> <ol style="list-style-type: none"> 1. Introduce more primary literature into the upper-division courses 2. Improve presentation in the scientific style 	<p>Academic Year 2015 - 2016</p> <p>Next review 2022-2023</p>	

<ul style="list-style-type: none"> ● Service to the Community at Large: Every student in the major will, either as part of a course or as a co-curricular activity, participate in one or more of the science outreach programs offered by the chemistry department or through the Pepperdine Chapter of the Student Affiliates of the American Chemical Society. 					
<p>2012</p> <ol style="list-style-type: none"> 1. Critical Thinking and Problem Solving Successfully solve multistep problems in Organic, Analytical, and a third subdiscipline of the field. In at least one case, critical evaluation of the quality or usefulness of the data presented must be evaluated and explained. 2. Written and Oral Communication Reports of independently obtained laboratory results and analysis must be presented in the scientific format. The effectiveness of presentation and the linguistic quality of the report will be evaluated. A seminar must be presented on a current or historical topic in chemistry in which all of the chemistry department community is invited to attend. The effectiveness and quality of presentation will be evaluated. 3. Technical Skills Each student in the major will be evaluated on their technical competence in the laboratory with respect to operating the chemical instrumentation and properly handling apparatus specific to certain subdisciplines. 4. Service to the Community at Large Every student in the major will, either as part of a course or as a co-curricular activity, participate in one or more of the science outreach programs offered by the chemistry department or through the Pepperdine Chapter of the Student Affiliates of the American Chemical Society. 		<p>We use important proxies for the assessment of important concepts in our advanced course (CHEM 340).</p> <p>While the level of expertise developed by students using chemical instrumentation throughout the curriculum is informally assessed regularly, students have been formally assessed in Instrumental Analysis since 2010.</p> <p>The chemistry majors enrolled in Chemistry Literature and Seminar (CHEM 400) will participate in outreach to the high school community. The Student Affiliates Chapter of the American Chemical Society (the Chemistry Club) provides students in the Chemistry program with a variety of</p>	<p>All members of the chemistry faculty will interpret results of learning outcome assessments.</p>	<p>Faculty revisit teaching strategies every year (often every semester) to insure that this outcome is met.</p> <p>Grading rubrics are updated as necessary and the quality of feedback is improved.</p> <p>Based on results of the assessments, improvements in methodologies to teach handling, assembly, and use of apparatus and instrumentation is modified. This is one our most frequent assessments since the cost of failure is both resource and financially significant.</p> <p>Our motivation is that every student in the major will at least participate in service-oriented projects. This assessment identifies which programs are not adequately serving our majors.</p>	

		<p>opportunities to participate in service to the college community or the school groups from the general public.</p> <p>Example: In Chemistry 340 to assess PLO # 2, students were required to write 5 detail laboratory reports in journal style, 3 short manuscripts similar to monographs used for technical reports in the chemical industry, and present 2 reports similar in form to that which would be received by a research chemist after sending a compound to an independent laboratory for chemical analysis. Both written and oral reports were then graded following a standardized rubric, and feedback was provided to the student. The rubric and the results are available in the Annual Report.</p>			
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MATHEMATICS

<p>Yes:</p> <ul style="list-style-type: none"> Formulate mathematical proofs that are clear, correct, complete, and logical. Demonstrate an understanding of the knowledge and skills central to the discipline of mathematics. Demonstrate the ability to apply appropriate mathematical ideas to both abstract and real-world contexts. Demonstrate a willingness to serve by having participated in co-curricular activities that are central to the broader mathematical community. 	<p>Published on the Pepperdine website</p>	<p>2015-2016 Direct Data</p> <ol style="list-style-type: none"> Exams of Proof-Writing scored on a rubric <p>Indirect Data</p> <ol style="list-style-type: none"> <p>Authentic Assessment</p> <ol style="list-style-type: none"> 	<p>2015-2016</p> <ul style="list-style-type: none"> Kevin Iga - Prepared Report with Mathematics Program Faculty: Joshua Bowman, Courtney Davis, Don Hancock, Kendra Killpatrick, Tim Lucas, David Strong, Don Thompson and Former Mathematics faculty: Carol Adjemian, Brian Fisher <p>with the help of: Helen Holmlund in the Natural Science Division office</p>	<p>2015-2016</p> <ol style="list-style-type: none"> Modified the course requirements for the Mathematics Major, Modified and added some new courses Renumbered the courses 	<p>Academic Year 2010 - 2011</p> <p>Next review 2022-2023</p>
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<p>2012</p> <ol style="list-style-type: none"> 1. Formulate mathematical proofs that are clear, correct, complete, and logical. 2. Demonstrate an understanding of the knowledge and skills central to the discipline of mathematics. 3. Demonstrate the ability to apply appropriate mathematical ideas to both abstract and real-world contexts. 4. Demonstrate a willingness to serve by having participated in co-curricular activities that are central to the broader mathematical community. 		<p>A few questions will be inserted in the final in the Transition to Abstract Mathematics to determine if students are able to formulate clear, correct, complete and logical mathematical proofs. These will be graded using a similar rubric to that of the previous study.</p> <p>The Major Field Exam in Math will be offered to the Math 370, Real Analysis I class in the Fall of 2012. It can be hoped that most of our students would at least rank in the 50th percentile.</p> <p>Group projects will be assigned in the Differential Equations class, and the generated posters will be graded according to a rubric.</p> <p>We expect that by the time they graduate,</p> <ol style="list-style-type: none"> 1. 20% of our students will have presented a paper at one outside conference (MAA local or national, Pacific Coast Undergraduate Math Conference, or other) 2. 80% of our students will have presented a paper internally (Tea Talk, Class presentation, Natural Science Seminar, 	<p>All of the faculty in mathematics will meet to evaluate the data collected from our various assessments.</p>	<p>Where there are particular areas of weakness, the math faculty will determine ways to address these either in the Transitions course or in moving some additional proof-writing to lower level courses. Math department will work towards the introduction of a capstone course.</p>	<p>2010 5-year review: 2011</p>
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		<p>talk at Math Day, or other) 30% of our students will have participated in a volunteer activity related to math (officer of one of the math clubs, participate at Math Day/Night at a local school, assist at Math Day or other math conference on campus, or other).</p> <p>Example: The math department chose to assess PLO # 1 in the "Transition to Abstract Mathematics" course. By using a pre-course and post-course homework assignment. The course is intended to introduce students to proofwriting. The homework assignment was designed to assess student growth in logic and in writing the three types of proofs being focused on for that review. Out of 18 possible points, the mean score on the pre-course assignment was 3, while on the post-course assignment it was 15, using the same pre-designed rubric on both assignments. More detailed analysis is available in the Annual Report</p>			
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NUTRITION						
<p>Yes:</p> <ol style="list-style-type: none"> The student who graduates with a major in Nutritional Science concomitantly completing the Academy of Nutrition and Dietetics' Didactic Program requirements should be able to successfully participate in dietetic internships and/or post-baccalaureate programs: pass the registration examination for entry-level dietitians; continue lifelong learning of Nutritional Science; and maintain productive future careers emphasizing service and diversity in nutrition, public health and dietetics. The student who graduates with a major in Nutritional Science concomitantly completing the Academy of Nutrition and Dietetics' Didactic Program requirements should be able to integrate research using current technology in the advancement and dissemination of knowledge related to nutrition as an applied science and 	<p>Published on the Pepperdine website</p>	<p>2015-2016 Direct Data</p> <ol style="list-style-type: none"> Exams Presentations graded on a rubric Food experiments graded on a rubric Capstone research paper <p>Indirect Data</p> <ol style="list-style-type: none"> Discussions Presentations Capstone research presentation <p>Authentic Assessment</p> <ol style="list-style-type: none"> Pre and Post Surveys MOA Paper ACEND exam Lab Analysis Capstone experimental design and data analysis 	<p>2015-2016 Susan Edgar Helm - Principal assessor</p>	<p>2015-2016</p> <ol style="list-style-type: none"> A new curriculum beginning in Fall 2016, with plans to assess in the 5-year cycle 	<p>Academic Year 2015 - 2016</p> <p>Next review 202-2023</p>	

<p>eventually, assume roles in leadership, management, and policy development.</p>					
<p>2012</p> <p>ACEND - Accreditation Council for Education in Nutrition and Dietetics (effective 1/1/12) formerly called, CADE -Commission on the Accreditation of Dietetics Education Nutritional Science DPD Handbook 2011- 2012</p> <p>Pepperdine Nutritional Science website (pepperdinenutritionalscience.com)</p>		<p>The following primary forms of direct evidence are/will be collected and analyzed to assess our student learning:</p> <ul style="list-style-type: none"> ● Pass rate of first-time test takers on the registration examination ● Employee Success – survey using expectations of Nutritional Science program ● Employer Satisfaction – survey using expectations of Nutritional Science program ● Dietetic Internship program satisfaction with our graduates – survey Program completion – completed DPD program within 4 years ● Graduate Performance – Acceptance to graduate and professional schools; supervised program placement; employment; mission work; sabbatical (at home) ● Graduating senior opinion survey – covering the goals of the Natural Science Division 	<p>Susan Helm served as assessment coordinator (revising SLOs, coordinating assessment meetings, and writing the report).</p> <p>Full time, Adjunct, and Visiting faculty members; current students; colleagues teaching courses with Nutritional Science majors and the Nutritional Science Advisory Committee; participated in assessment activities (providing data, developing objectives, and working on classroom implementation</p>	<p>The findings from the primary forms of direct evidence currently being collected are used to assess student learning and for accreditation by our outside agency, CADE, to be called ACEND, effective 1/1/12.</p>	<p>October 2010, CADE PAR (CADE Program Assessment Report) May, 2011 Natural Science Division , Program Assessment</p>

		<ul style="list-style-type: none"> ● Alumni survey – covering the goals of the Nutritional Science program Analytical Process; Integration of evidence-based research into coursework and projects – Senior Capstone (NUTR 450) ● Preparation of Grant Proposal for Program Plan for local community group and Productivity Tools (Powerpoint, Excel, Courses) (NUTR 220) ● Progressive Coursework NUTR 101 – pre&post knowledge survey NUTR 210 – lab practical NUTR 220 – IRB proposal NUTR 300 – mock exam NUTR 310 – 1 final exam question NUTR 450 – 1 final exam question <p>Example: To assess SLO # 3, NUTR 450 (Capstone course) uses a complete literature review, capstone paper (avg. 45 pages), oral presentation with DPD director, and a 45 minute presentation evaluated by peers, Nutritional Science</p>			
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		faculty, and NS Advisory Committee Members. Results are available in the Annual Report.			
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PHYSICS						
<p>Yes:</p> <ul style="list-style-type: none"> ● Demonstrate knowledge of the theoretical underpinnings of physics by solving problems in classical mechanics, electromagnetism, thermodynamics, and quantum mechanics. ● Recognize the role of observation and experimentation in science by utilizing basic laboratory techniques and data analysis to study physical phenomena. ● Communicate experimental results, theoretical solutions, and general knowledge of physics in both written and oral forms. ● Foster a culture of science and interest in physics within the greater community by having participated in co-curricular outreach or research activities. 	Published on the Pepperdine website	<p>2015-2016</p> <p>Direct Data</p> <ol style="list-style-type: none"> 1. Quizzes 2. Exams 3. Lab write-ups <p>Indirect Data</p> <ol style="list-style-type: none"> 1. Student surveys 2. Student research <p>Authentic Assessment</p> <ol style="list-style-type: none"> 1. Student research 2. Internships/jobs 3. Graduate school admissions 	2015-2016	<p>2015-2016</p> <ol style="list-style-type: none"> 1. Re-evaluated the PLOs 2. Two new upper division courses have been added to the curriculum 3. Undergraduate research programs have been implemented with an emphasis on recruiting first year students. This has helped prepare the students for summer internships. 4. Physics 330 had the name changed from Intermediate Mechanics to Classical Mechanics. 5. Physics 380 (modern physics lab) was changed from a 2 to 3 unit course in order to broaden the scope of and number of experiments for the course. 	<p>Academic Year 2015 - 2016</p> <p>Next review 2022 - 2023</p>	
<p>2012</p> <ol style="list-style-type: none"> 1. Demonstrate the ability to analyze and write complete reports on laboratory experiments. 2. Demonstrate an understanding of the operation of sophisticated research instruments (such as Hall Effect, EPR/NMR, and Atomic Spectroscopy). 		<p>Specific embedded questions on exams of Physics 202, 203, 210, and 211 are being used.</p> <p>Laboratory courses are requiring students to</p>	The course instructor and Physics Faculty are interpreting the evidence from the exams and quality of activities in the lab work.	The Physics Faculty are reviewing the results of the plans of assessment and of the program during each semester, at the end of each semester, and will be discussed in detail in late March or April annually with the goal of	2010	

<p>3. Demonstrate the ability to understand and explain concepts and solve problems in Classical and Quantum Physics</p>		<p>perform data analysis using common software programs designed for this purpose.</p> <p>Students are making laboratory measurements and writing up laboratory reports on their experiments.</p> <p>Laboratory performances and written reports are demonstrating experimental competence.</p> <p>ETS MFTest in Physics will be given in March or April (2012) to graduating seniors.</p> <p>Every five years, a general questionnaire will be mailed to alumni to solicit their feedback on the adequacy of their physics education.</p> <p>We regularly communicate with our graduates to see how they are doing. We usually ask if changes in our program would have benefitted them.</p>	<p>TA's are using the rubrics set up by the instructors and grading the lab reports, then discussing the results with the instructors.</p>	<p>modifying the program assessment plan. Based on the findings, program changes (improvements) will be implemented if deemed necessary.</p>	
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SPORTS MEDICINE						
<p>Yes:</p> <ul style="list-style-type: none"> • Demonstrate a breadth of knowledge across the spectrum of the exercise sciences and a deeper understanding in the areas of physiology, motor behavior and biomechanics. • Apply the scientific method in order to understand, evaluate, and/or solve problems in the exercise sciences. • Use the central components of a liberal education, including critical thinking, information literacy, oral and written communication, and quantitative reasoning skills in analyzing problems in the exercise sciences. 	Published on the Pepperdine website	<p>2015-2016</p> <p>Direct Data</p> <ol style="list-style-type: none"> 1. Laboratory reports 2. Exams 3. Research project with written and oral components graded on a rubric 4. Critical thinking questions asked at the beginning and end of the semester <p>Indirect Data</p> <ol style="list-style-type: none"> 1. Alumni surveys <p>Authentic Assessment</p> <ol style="list-style-type: none"> 1. Undergraduate involvement in faculty research 2. Internships 	2015-2016	<p>2015-2016</p> <ol style="list-style-type: none"> 1. New full-time tenure-track positions 	<p>Academic Year 2015 - 2016</p> <p>Next review 2022-2023</p>	
<p>2012</p> <ol style="list-style-type: none"> 1. Demonstrate a breath of knowledge across the spectrum of the exercise sciences and a deeper understanding in the areas of physiology, motor behavior and biomechanics. 2. Apply the scientific methods and experimental design to understand, evaluate, or solve problems in the exercise sciences. 		The SPME program continues to assess the four learning outcomes using direct and indirect (and authentic) evidence to determine if the program learning outcomes are being met by the program offerings.	Cooker Perkins serves as the assessment coordinator (maintaining assessment schedule, coordinating assessment meetings, and writing the report(s))	Given the increased number of meetings about the program as well as the concurrent assessment of the GE program at Seaver, Sports Medicine has refined their program learning outcomes, set a 5- year ongoing assessment schedule, and made changes to courses that satisfy	<p>May 2010 (1-year review)</p> <p>May 2009 (5-year review)</p>	

<p>3. Use the central components of a liberal education, including critical thinking, oral and written presentation, information literacy, and quantitative reasoning skills in analyzing problems in exercise sciences.</p> <p>4. Enter a career in applied or clinical health professions or continue graduate study in disciplines related to the exercise sciences</p>		<p>Direct Evidence: PLO 1 – embedded exam questions across courses, with a focus on mastery level courses (SPME 410, 430, 440, and 460) PLO 2 – Research projects (SPME 430 and MTH 317) and practicum (SPME 450) PLO 3 – Writing samples (SPME 410) and research presentations (SPME 430, 440) PLO 4 – Lab practicum (SPME 460)</p> <p>Indirect and/or Authentic Evidence: PLO 1 – student satisfaction survey, senior survey PLO 2 – undergraduate research projects, senior survey PLO 3 – senior survey PLO 4 – internship experience, senior survey</p> <p>Results of the assessment can be found in the SPME annual report.</p>	<p>6 of 8 full-time faculty are regularly involved and participate in assessment activities (providing data, developing objectives, and working on classroom implementation.</p> <ul style="list-style-type: none"> - Feltner M - Jasperse J - MacRae H - MacRae P - Nelson L - Perkins C 	<p>the GE requirement. Based on the assessment activities of the previous year, the following action items were determined:</p> <ol style="list-style-type: none"> 1. Need for one full-time tenure-track position and one visiting position in Sports Medicine 2. Drop the Coaching Minor 3. Drop Physics 203 as a required course in SPME B.S. curriculum <p>Going forward, the evidence regularly collected on student learning will inform necessary changes to the course design, program curriculum, and program learning outcomes.</p>	
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