

## UC San Diego - WASC Exhibit 7.1 Inventory of Educational Effectiveness Indicators

Academic Program	(2a) What are these learning outcomes?  <u>Students graduating with a degree should be able to:</u>	(3) Other than GPA, what data/evidence are 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?
<p><b>Department:</b> Structural Engineering</p> <p><b>Major:</b> Structural Eng.</p> <p><b>(1) Have formal learning outcomes been developed?</b> Yes</p> <p><b>(6) Date of the last Academic Senate Review? [i.e. 2015-16 if the review takes place this academic year]</b> 2017</p> <p><b>10/14/2018</b> Please date the form</p>	<p><b>Written Communication</b></p> <ul style="list-style-type: none"> <li>d) An ability to function in multidisciplinary teams.</li> <li>g) An ability to communicate effectively with written, oral, and visual means.</li> </ul>	<p><b>Written Communication</b></p> <ul style="list-style-type: none"> <li>• A matrix has been generated that describes the mapping of student outcomes to individual SE courses.</li> <li>• For each outcome, an additional evaluation matrix has been created as an assessment tool (rubric) to evaluate individual traits of an outcome based on four achievement levels.</li> <li>• To ensure that all students have the skills necessary for successful professional practice (team participation and effective verbal/written communication), group activities and projects, written reports and formal verbal presentations are required in a number of courses starting from freshman year and assessed directly using a rubric.</li> <li>• Assessment of student outcomes through graduating senior survey and through Jacobs School alumni survey.</li> <li>• Assessment of program objectives and of student outcomes through employer survey.</li> <li>• Assessment of courses and individual course outcomes through self-evaluation by faculty teaching the course. This enables courses to be continuously improved to better meet both students' needs and the Department's goals and objectives.</li> <li>• Assessment of courses through student surveys conducted by CAPE.</li> <li>• Assessment of course outcomes by department-administered student surveys.</li> </ul>	<p><b>Written Communication</b></p> <ul style="list-style-type: none"> <li>• Undergraduate Affairs and ABET Committees regularly review student outcomes.</li> <li>• An Industrial Advisory Board is also convened annually to provide input on various aspects of the program assessment (objectives, outcomes).</li> <li>• All of the evidence collected in column (3) is evaluated by the Undergraduate Affairs and ABET committees.</li> <li>• The faculty self-assessments are reviewed quarterly by Faculty ad hoc Curriculum Committees for a variety of sub-disciplines. Issues raised by these committees are reviewed by Undergraduate Affairs and ABET committees.</li> <li>• Vice Chair for Undergrad Affairs acts on all requests/petitions for variation of requirements.</li> </ul>	<p><b>Written Communication</b></p> <ul style="list-style-type: none"> <li>• Individual course instructors use feedback to modify their classes.</li> <li>• ACS collects annual data from all approved departments and publishes outcomes.</li> <li>• An action plan is developed based on the measurement and assessment of surveys, the evaluation and analysis of faculty self-assessments, and results from direct assessments.</li> <li>• Based on the findings, the department adjusts requirements and course sequences for the major.</li> <li>• Any curriculum improvements recommended by the Undergraduate Affairs and ABET committees must be endorsed by the faculty before implementation.</li> </ul>
	<p><b>Oral Communication</b></p> <ul style="list-style-type: none"> <li>d) An ability to function in multidisciplinary teams.</li> <li>g) An ability to communicate effectively with written, oral, and visual means.</li> </ul>	<p><b>Oral Communication</b></p> <ul style="list-style-type: none"> <li>• A matrix has been generated that describes the mapping of student outcomes to individual SE courses.</li> <li>• For each outcome, an additional evaluation matrix has been created as an assessment tool (rubric) to evaluate individual traits of an outcome based on four achievement levels.</li> <li>• To ensure that all students have the skills necessary for successful professional practice (team participation and effective verbal/written communication), group activities and projects, written reports and formal verbal presentations are required in a number of courses starting from freshman year and assessed directly using a rubric.</li> <li>• Assessment of student outcomes through graduating senior survey and through Jacobs School alumni survey.</li> <li>• Assessment of program objectives and of student</li> </ul>	<p><b>Oral Communication</b></p> <p>Same as above.</p>	<p><b>Oral Communication</b></p> <p>Same as above.</p>

		<p>outcomes through employer survey.</p> <ul style="list-style-type: none"> <li>• Assessment of courses and individual course outcomes through self-evaluation by faculty teaching the course. This enables courses to be continuously improved to better meet both students' needs and the Department's goals and objectives.</li> <li>• Assessment of courses through student surveys conducted by CAPE.</li> <li>• Assessment of course outcomes by department-administered student surveys.</li> </ul>		
	<p><b>Quantitative Reasoning:</b></p> <p>a) An ability to apply knowledge of mathematics, science, and engineering.</p> <p>b) An ability to design and conduct experiments, as well as being able to analyze and interpret data.</p> <p>c) An ability to design a system, component, or process to meet desired needs.</p> <p>e) An ability to identify, formulate, and solve engineering problems.</p> <p>k) An ability to use modern engineering techniques, skills, and computing tools necessary for engineering practice.</p>	<p><b>Quantitative Reasoning</b></p> <ul style="list-style-type: none"> <li>• A matrix has been generated that describes the mapping of student outcomes to individual SE courses.</li> <li>• For each outcome, an additional evaluation matrix has been created as an assessment tool (rubric) to evaluate individual traits of an outcome based on four achievement levels.</li> <li>• Student knowledge and skills are evaluated and monitored through direct assessments (exams, group projects, homework assignments, reports and presentations).</li> <li>• Fundamentals in Engineering pre-professional licensing exam taken during senior year (optional).</li> <li>• Assessment of student outcomes through graduating senior survey and through Jacobs School alumni survey.</li> <li>• Assessment of program objectives and of student outcomes through employer survey.</li> <li>• Assessment of courses and individual course outcomes through self-evaluation by faculty teaching the course. This enables courses to be continuously improved to better meet both students' needs and the Department's goals and objectives.</li> <li>• Assessment of courses through student surveys conducted by CAPE.</li> <li>• Assessment of course outcomes by department-administered student surveys.</li> </ul>	<p><b>Quantitative Reasoning</b></p> <p>Same as above.</p>	<p><b>Quantitative Reasoning</b></p> <p>Same as above.</p>
	<p><b>Information Literacy</b></p> <p>f) An understanding of professional and ethical responsibility.</p> <p>h) The broad education necessary to understand the impact of engineering solutions in a global and societal context.</p> <p>i) A recognition of the need for and an ability to engage in life-long learning.</p> <p>j) A knowledge of contemporary issues.</p> <p>k) An ability to use modern engineering techniques, skills, and computing tools necessary for engineering practice.</p>	<p><b>Information Literacy</b></p> <ul style="list-style-type: none"> <li>• A matrix has been generated that describes the mapping of student outcomes to individual SE courses.</li> <li>• For each outcome, an additional evaluation matrix has been created as an assessment tool (rubric) to evaluate individual traits of an outcome based on four achievement levels.</li> <li>• SE 1, SE 103, and SE 140A/B, or SE 143A/B: The design sequence provides several experiences that require student teams to design, build, and test structures. Economics, sustainability, and ethical, social and political considerations are also introduced.</li> <li>• Assessment of student outcomes through graduating senior survey and through Jacobs School alumni survey.</li> <li>• Assessment of program objectives and of student outcomes through employer survey.</li> <li>• Assessment of courses and individual course outcomes through self-evaluation by faculty teaching the course. This enables courses to be continuously improved to better meet both students' needs and the Department's</li> </ul>	<p><b>Information Literacy</b></p> <p>Same as above.</p>	<p><b>Information Literacy</b></p> <p>Same as above.</p>

		<p>goals and objectives.</p> <ul style="list-style-type: none"> <li>• Assessment of courses through student surveys conducted by CAPE.</li> <li>• Assessment of course outcomes by department-administered student surveys.</li> </ul>		
	<p><b>Critical Thinking</b></p> <p>b) An ability to design and conduct experiments, as well as being able to analyze and interpret data.</p> <p>c) An ability to design a system, component, or process to meet desired needs.</p> <p>e) An ability to identify, formulate, and solve engineering problems.</p>	<p><b>Critical Thinking</b></p> <ul style="list-style-type: none"> <li>• A matrix has been generated that describes the mapping of student outcomes to individual SE courses.</li> <li>• For each outcome, an additional evaluation matrix has been created as an assessment tool (rubric) to evaluate individual traits of an outcome based on four achievement levels.</li> <li>• Student knowledge and skills are evaluated and monitored through direct assessments (exams, group projects, homework assignments, reports and presentations).</li> <li>• Fundamentals in Engineering pre-professional licensing exam taken during senior year (optional).</li> <li>• SE 1, SE 103, and SE 140A/B, or SE 143A/B: The design sequence provides several experiences that require student teams to design, build, and test structures. Economics, sustainability, and ethical, social and political considerations are also introduced.</li> <li>• Assessment of student outcomes through graduating senior survey and through Jacobs School alumni survey.</li> <li>• Assessment of program objectives and of student outcomes through employer survey.</li> <li>• Assessment of courses and individual course outcomes through self-evaluation by faculty teaching the course. This enables courses to be continuously improved to better meet both students' needs and the Department's goals and objectives.</li> <li>• Assessment of courses through student surveys conducted by CAPE.</li> <li>• Assessment of course outcomes by department-administered student surveys.</li> </ul>	<p><b>Critical Thinking</b></p> <p>Same as above.</p>	<p><b>Critical Thinking</b></p> <p>Same as above.</p>
	<p><b>(2b)</b></p> <p><b>Where are the learning outcomes published? Please provide your department/program website address.</b></p> <p><b>SE Website:</b>  <a href="http://www.structures.ucsd.edu/">http://www.structures.ucsd.edu/</a></p> <p><b>SE UG Handbook:</b>  <a href="http://se.ucsd.edu/sites/se.ucsd.edu/files/academic-files/UG.Hndbk_.%20Revised%2010.16.18.pdf">http://se.ucsd.edu/sites/se.ucsd.edu/files/academic-files/UG.Hndbk_.%20Revised%2010.16.18.pdf</a></p> <p><b>SE ABET Google Drive:</b>  <a href="https://drive.google.com/drive/folders/0BzCSCCYT-cS9aGNzQUh6WmRJZTQ">https://drive.google.com/drive/folders/0BzCSCCYT-cS9aGNzQUh6WmRJZTQ</a></p>			