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

Academic Program	(2a) What are these learning outcomes? **Students graduating with a degree should be able to:**	(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?
Department: **Major: Biological Sciences (all)** **(1) Have formal learning outcomes been developed?** **Yes** **(6) Date of the last Academic Senate Review? 2014-15**	Communication Clearly communicate an understanding of biological processes and principles including: - processes and forces contributing to evolutionary change - how evolution shapes the behavior, morphology, and life history of organisms - principles of heredity, its molecular basis, and regulation of gene expression - how energy, nutrients, metabolites and information are acquired and organized, and how they flow through biological systems - physiological mechanisms that coordinate functions within and between organ systems, along with underlying cellular processes - understand the properties, structures, and functions of biological molecules, and how they interact to accomplish processes that are essential and unique to living cells - understand the interactions between organisms, and between organisms and their environment, on a hierarchy of scales (organismal to global) Level of depth expected in each of the content areas above varies for our 7 distinct sub-majors	**Written Communication** Short (occasionally essay) answers on exams required in most classes*; lab reports required in all lab classes*; research proposal required for Introductory Biology Lab (BILD 4)*; research reports written for independent studies (BISP 196/197/199)†; contributions to student publication Saltman Quarterly†. *required for all students †opportunity for all students	**Written Communication** Instructors, instructional assistants, research mentors, poster judges, and faculty advisors of SQ evaluate student writing.	**Written Communication** Feedback from all evaluators is given to students to improve their writing. Instructional practices and assignments are modified to be more effective in developing student writing skills.
		Oral Communication Oral contributions in class (answering questions, contribution to discussion)*; oral presentation of research proposal required for Introductory Biology Lab (BILD 4)*; literature presentations in senior seminars (BIXX 194) and certain other classes†; research presentations in independent studies (BISP 196/197/199)†, and at the annual Research Showcase†; apprentice teaching via enrollment in BISP 195†. *required for all students †opportunity for all students	**Oral Communication** Instructors, Instructional Assistants, research mentors, and poster judges evaluate student skills. Feedback to Instructional Assistants (undergraduate students enrolled in BISP 195) on their communication skills is also provided by their students via the online IA evaluation system.	**Oral Communication** All evaluators provide feedback to students to help them improve their oral communication skills. Instructional and mentoring practices, and individual assignments, are modified to be more effective.
	Quantitative Reasoning: Learn calculus and statistical methods; apply these and other quantitative methods to analyze biological systems and data from experiments investigating these systems; draw appropriate conclusions from these analyses.	**Quantitative Reasoning** Answers to exam, quiz, and clicker questions requiring quantitative reasoning/problem solving*; program-wide assessment of student skills in quantitative reasoning*; student performance in project tasks and research presentations requiring quantitative reasoning in lab classes* and independent study†. *required for all students †opportunity for all students	**Quantitative Reasoning** Instructors, instructional assistants, and research mentors evaluate student responses and thought processes. Education Committee examines results of program-wide assessment.	**Quantitative Reasoning** All evaluators continually revise teaching practices and mentoring strategies based on evidence of student skills; Education Committee recommends and supports revision of instructional practices, revises major requirements, and commissions new courses strengthening student skills in this area.

Please date the form November 1, 2018	**Information Literacy** Evaluate the credibility and value of scientific information acquired from a variety of sources; search published literature and other sources of scientific information to retrieve and use credible information; know when citation of sources is appropriate in scientific writing and other presentations and how to cite sources; know the difference between plagiarism and appropriate citation of prior work with attribution.	**Information Literacy** Oral and written presentations requiring use of scientific information not provided by the instructor in lecture classes*, lab classes* and senior seminars (BIXX 194)†; research presentations by students participating in independent studies (BISP 196/197/199)†; articles written for student publication Saltman Quarterly†. *required for all students †opportunity for all students	**Information Literacy** Instructors, Instructional Assistants, research mentors, SQ advisors, and poster judges evaluate student retrieval, use and citation of scientific information.	**Information Literacy** All evaluators continually revise their practices to improve guidance given to students in this area, and create assignments to stimulate student learning such as plagiarism awareness training
	Critical Thinking Construct reasonable hypotheses to explain biological phenomena; design effective experiments to test hypotheses; interpret and draw appropriate conclusions from data; habitually analyze everyday events using principles of scientific enquiry such as basing conclusions on evidence.	**Critical Thinking** Answers to exam, quiz and clicker questions requiring interpretation of data in all classes*; research proposal required in Introductory Biology Laboratory (BILD 4)*; written and oral assignments and contributions to discussion in lecture and lab classes*, senior seminars (BIXX 194)†, and independent studies (BISP 196/197/199)†; student presentations at annual Research Showcase†; results of program-wide assessment of critical thinking skills*. *required for all students †opportunity for all students	**Critical Thinking** Instructors, Instructional Assistants, and research mentors evaluate student responses on in-class assessments, in written and oral presentations, and during informal discussions. Education Committee evaluates results of program-wide assessment.	**Critical Thinking** All evaluators continually revise their practices to develop student awareness of the need for critical thinking and skill in using it. Education Committee recommends and supports revision of instructional practices, revises major requirements and commissions new courses strengthening student skills in this area.
	(2b) **Where are the learning outcomes published? Please provide your department/program website address.**	**https://biology.ucsd.edu/education/undergrad/maj-min/index.html**		