Course Expectations for Lower Division Laboratory Activity (B3) (1 unit; may be an overlay)

To be certified by the Baccalaureate Requirements Committee as meeting the lower-division laboratory activity (B3) general education requirement,

1. The course must be lower division and open to all students. Courses that are numbered between 100 and 199 may not have prerequisites other than passage of an assessment test to determine readiness for college-level work in the subject (which might include EPT, ESLPT, ELM, or other departmental tests), or an exemption for one or more of these tests. Prerequisite assessments and scores must be available before the semester begins. If results of prerequisite assessment tests are not available to students prior to registration for the course, sample tests or online tutorials will be available to allow students to self-assess their readiness for the course. Courses that are numbered between 200 and 299 may have a single prerequisite, but departments and programs must provide an adequate justification for that prerequisite. Typically, students should be eligible to enroll in lower division general education courses in their first year;

2. Courses satisfying the requirements for Area B3 will typically be associated with a lecture course in Area B1 or B2. They will ideally be embedded in the lecture course so that no additional units are added, but they may be a separate course with additional units. In the case of a separate laboratory course that is a companion to a lecture course in Area B1 or B2, the co- or pre-requisite may be the corresponding lecture course;

3. The syllabus must list the university-approved student learning outcomes for laboratory activity (B3) and link them to activities and/or assignments that students complete to demonstrate they have met the outcomes; and

4. The course will include discussion of how the laboratory work relates to current research in science, the consequences that seemingly minor oversights in accurate recording of data can have, and how scientific principles learned in the lab can apply to situations outside of the laboratory.

Student Learning Outcomes for Lower Division Laboratory Activity (B3) (1 unit; may be an overlay)

After completion of a lower division laboratory activity related to a course in Area B1 or B2, students will be able to:

1. apply appropriate methods of analysis to raw data;

2. carry out common laboratory procedures correctly and adhere to instructions on laboratory safety; recognize hazardous situations and act appropriately;

3. maintain a timely, comprehensive laboratory notebook, including any outside or background research, with sufficient detail to permit repeatability of experiments;

4. explain the scientific method, including concepts of hypothesis and experimental controls, and why objectivity is essential; and

5. apply critical thinking in the laboratory and recognize whether results and conclusions make
Links between Educational Goals and Outcomes for Lower Division Lab Science

The student learning outcomes were developed in relationship to the “Educational Goals for the Baccalaureate at San Francisco State University.” The chart below illustrates that relationship for lower division lab science. The numbers correspond to the way the educational goals and student learning outcomes are numbered above.

<table>
<thead>
<tr>
<th>Educational Goals</th>
<th>Student Learning Outcomes for Lower Division Lab Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competencies for Lifelong Intellectual Endeavor</td>
<td>3</td>
</tr>
<tr>
<td>2. Intellectual Attainments</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>4. Ethical Engagement</td>
<td>5</td>
</tr>
<tr>
<td>5. Integration and Application of Knowledge</td>
<td>6, 7</td>
</tr>
</tbody>
</table>

From Appendix B to Requirements for Baccalaureate Degree S-15-255