Course Expectations for Lower Division Physical Science (B1) (3 units) [preferably including a lab (see B3) within 3 units]

To be certified by the Baccalaureate Requirements Committee as meeting the lower-division physical science (B1) 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. The syllabus must list the university-approved student learning outcomes for physical science (B1) and link them to activities and/or assignments that students complete to demonstrate they have met the outcomes;

3. Students will be taught the steps in the scientific method of inquiry, which involves gathering observable, empirical and measurable evidence subject to specific principles of reasoning. The course will emphasize that the degree of acceptance of a theory by the scientific community grows as the number of reproducible observations of its predictions increases;

4. The utility of alternative scientific hypotheses in the development of scientific theories will be discussed. Examples will be given of how scientific evidence is used to develop hypotheses and theories; and

5. Course content will focus on inquiry into the physical universe.

Student Learning Outcomes for Lower Division Physical Science (B1) (3 units)

After completion of a lower division general education course in physical science, students will be able to:

1. gather and interpret scientific information from a variety of sources and use that information to discuss scientific issues;

2. describe ethical or sociological dilemmas arising out of scientific research and applications, which may include those related to social justice, and may have implications for local and/or global communities;

3. use scientific theories and methods of inquiry to explain phenomena observed in laboratory or field settings; and

4. discuss the relevance of major scientific theories and/or research to modern day life.
Links between Educational Goals and Outcomes for Lower Division Physical 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 physical 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 Physical 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>