

**Liberal Studies Assessment Report
C5 – Physical and Biological Sciences**

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Liberal Studies Assessment

C5 – Physical and Biological Sciences

Syllabi Review

- 1) Tally the total number of syllabi which have addressed each specific goal listed below. Total number of syllabi reviewed = 16
(Please note that not all objectives need to be addressed in all Liberal Studies courses.)

Review of Student Work

- 2) When reviewing student work, use the general holistic rubric below to analyze how well the student met the objective and break down the number of student work products into the following categories.

1-Unsatisfactory – Student work reflects a level of mastery below that expected of a college graduate.

2- Meets expectations – Student work reflects a level of mastery consistent with that of a college graduate.

3- Exceeds expectations – Student work reflects a level of mastery above that expected of a college graduate.

Total number of student products/portfolios reviewed= 121

Review of Faculty Surveys

- 3) Using the survey data provided, report the results (if any) addressing each goal.
See Table below

Review of Student Surveys

- 4) Using the survey data provided, report the results (if any) addressing each goal.
Sample size (N=3) was too low to make any valid interpretation.

Overarching Learning Goals of the Liberal Studies Program:

Learning Goal	# of syllabi addressing each goal	# of student products reflecting each level of mastery as described above		
Demonstrate the ability to locate, analyze, and evaluate information	15	Level 1 16 students Average Level= 2.06	Level 2 82 students Total samples addressing goal = 121	Level 3 23 students
Demonstrate the ability to synthesize information	16	Level 1 15 students Average Level= 2.07	Level 2 82 students Total samples addressing goal = 121	Level 3 24 students
Demonstrate the ability to interpret and use numerical, written, oral and visual data	16	Level 1 21 students Average Level= 2.02	Level 2 76 students Total samples addressing goal = 121	Level 3 24 students
Demonstrate the ability to read with comprehension, and to write and speak clearly, coherently, and effectively as well as to adapt modes of com. appropriate to an audience	15	Level 1 16 students Average Level= 2.30	Level 2 80 students Total samples addressing goal = 114	Level 3 18 students
Demonstrate the ability to critically analyze arguments	15	Level 1 14 students Average Level= 1.97	Level 2 43 students Total samples addressing goal = 69	Level 3 12 students
Demonstrate the ability to recognize behaviors and define choices that affect lifelong well-being	10	Level 1 4 students Average Level= 2.08	Level 2 14 students Total samples addressing goal = 24	Level 3 6 students

NOTE: Faculty survey does not address the overarching learning goals.

(C5) Physical and Biological Sciences

Learning Objectives	# of Syllabi Addressing Each Goal	# of Students at Various Levels of Mastery as Described Above	Survey Data Results from Faculty Addressing Each Goal
Students will view the human being as having concerns continuous with, though different from, those of other organisms of nature. (Biological Sciences)	5	Level 1= 5 students Level 2 = 46 students Level 3 = 14 students Average Level= 2.14 Total samples addressing goal = 65	All (n=3) formally assessed this goal with exams. Two of the three also used discussion/debate and lab work. One used group activity
Students will be directed toward the definition and solution of problems involving character of matter, energy, motion, or mechanical/dynamic energy. (Physical Sciences)	9	Level 1= 2 students Level 2 = 29 students Level 3 = 11 students Average Level= 2.21 Total samples addressing goal =42	Four of six formally assessed this goal. Three of the six informally assessed it. Four used exams, group activity, and lab work. Two used discussion/debate, writing assignment, and creative project. One used oral presentation.
Students will use scientific study to appreciate the tentative character of scientific conclusions: repeated experimental testing is needed in order to confirm assertions, and revision (even rejection) is allowed.	14	Level 1= 10 students Level 2 = 59 students Level 3 = 16 students Average Level= 2.07 Total samples addressing goal = 85	Physical: Three of six formally assessed this goal. Two informally assessed it. One marked n/a. All five who assessed the goal used exams. Four used writing assignment and group activity. Two used discussion/debate and group activity. One used creative project. Biological: Two of three formally assessed this goal. One marked n/a. Both who assessed the goal used exams and lab work. One used discussion/debate. One used group activity.
Students will experience, through laboratory work, the environment in which scientific study is conducted.	9	Level 1= 4 students Level 2 = 52 students Level 3 = 13 students Average Level= 2.13 Total samples addressing goal =69	no data

General comments concerning syllabi:

- Sixteen different syllabi were evaluated, representing 10 different courses. These syllabi represented the areas of Astronomy, Biology, Chemistry, Geology, Environmental Health, Environmental Science, Natural Resources Management and Physics. In general, the syllabi did an excellent job representing C5 learning goals and objectives.
- The two learning goals/objectives addressed least frequently in the syllabi examined were “demonstrate the ability to recognize behaviors and define choices that affect lifelong well-being”, and “students will experience, through laboratory work, the environment in which scientific study is conducted”. These two were only explicitly addressed in 60% of the syllabi examined.
- Some of the courses had a separate laboratory section, while other courses nested laboratory exercises into lecture periods. Syllabi of courses with a separate laboratory period provided more detail about specific activities and exercises than courses with nested laboratories. However, student work submitted indicated that these latter courses had a variety of hands-on activities and exercises related to achieving C5 learning goals and objectives. The hands-on component for ENVH-130 was not evident in the syllabus.

General comments concerning student work:

- Overall, student work reflected a level of mastery of meeting expectations in all learning goals and objectives (Level 2). All of the C5 courses are 100-level, therefore, we would not expect overall student performance to exceed expectations reflecting a level of mastery above that of a college graduate (Level 3).
- Student work indicated strength in their ability to provide accurate information, but their work was often poorly written and/or written in a simplistic manner. In addition, the lowest level of mastery reflected in student work was in the learning goal “demonstrate the ability to critically analyze arguments.
- | ➤ No samples of student work for ENVH-130 were available at this time.

Based on your review of the C5 documents please list the strengths and recommendations for the C5 courses (responding to the goals of the Liberal Studies program as well as the C5 category).

Strengths:

- Students have a wide variety of choices in courses in which to fulfill their C5 Liberal Studies requirement, and these choices are all doing an excellent job in compliance with the C5 learning goals and objectives.
- Assignments in all the courses were particularly strong in meeting seven of the ten C5 learning goals and objectives.
- The learning goals and objectives articulated for C5 courses are appropriate.

Recommendations:

- Syllabi could be more explicit at describing how science can be used to recognize behaviors and life choices that affect lifelong well-being.
- Students need more practice with critically analyzing arguments and writing short, well-constructed synthesis types of routine paragraphs. Therefore, assessment instruments should reflect these latter skills along with content knowledge.
- The syllabus for ENVH-130 does not appear to address the C5 learning objectives for physical science. Most importantly, the syllabus for ENVH-130 does not appear to include a laboratory or hands-on component. No samples of student work were available for this course due to unavoidable last minute changes in faculty. The laboratory and/or hands-on component is a central aspect of the C5 Liberal Studies learning objectives. The team would like the opportunity to review samples of student work in order to evaluate whether the course provides a laboratory or hands-on component when such materials become available. We would then like the opportunity to generate an updated report.