

**General Education Subcommittee
Report and Recommendations
From the Review of Block B of the General Education Program**

The Review Process

The General Education Assessment Plan envisioned that GE assessment would be an ongoing and continuous process with a new GE area reviewed each year to ensure continuous program improvement in all areas of the GE program. Under the GE student learning objectives for Block B, students should 1) demonstrate basic knowledge of the natural sciences, 2) understand and employ the methodologies of the natural sciences, and 3) demonstrate how the natural sciences enrich their lives and foster intellectual curiosity (*General Education Assessment Plan*, Goal 5, p. 7).

In Winter 2003 the GE Assessment Coordinator (GEAC) worked with faculty teaching Block B courses to draft an online student attitudinal survey (Appendix A). Individual stipends of \$250 were given to a faculty oversight group. The survey assessed student opinions about the contribution of Block B courses to learning about the natural sciences. Instructors of Block B courses had their students take an online survey in Spring 2003. After the survey, work on the assessment of Block B was put on hold while the self study for GE Program Review was being completed. Assessment of Block B resumed in Fall, 2005.

During Winter and Spring quarters, 2006 members of GES studied reports from Institutional Research on enrollment numbers, frequency and times of course offerings, FTES and average GPA in Block B courses from Fall 1998 through Fall 2005 (Appendix B). Several courses had not been offered on a regular basis. Emails were sent to department chairs asking them to confirm GES's records and to indicate whether they intended to offer the courses in the near future.

Members of GES also reviewed course syllabi to determine consistency with campus policy on syllabus content and GE policy on student learning outcomes, written assignments and active learning (Appendix C). The GEAC interviewed several Block B instructors to discuss their experiences in relation to the learning objective that students understand and employ the methods of the natural sciences (Appendix D). With the assistance of BIOL 155 instructors, the GEAC was able to conduct a direct assessment of student understanding of hypothesis testing that was embedded in written class assignments (Appendix E). The alumni survey for the GE program review also provided relevant information about the contribution of GE courses to the alumni's understanding of the natural sciences (Appendix F). Throughout the entire review process the GEAC regularly described the assessment instruments and activities to members of GES for their feedback.

Recommendations

In Spring 2006 GES completed its examination of Block B courses and approved the following recommendations for Block B of the GE Program:

Course Syllabi

General Education Subcommittee (GES) recommends that all Block B syllabi should

- a. State that the course satisfies the GE Block B, Natural Sciences requirement
- b. State the subcategory (e.g. Biological Science with Lab-**B1**, Physical Science with Lab-**B2**, Applied Natural Science-**B3**) to which the course belongs
- c. Conform to all University requirements for course syllabi as stated in the *Class Syllabus* policy in *Chapter V* of the *Faculty Handbook*.

GES further recommends that the Provost or designee:

- d. Ensure that the GE course syllabus template is provided to new faculty
- e. Send to all faculty on an annual basis a reminder of the syllabus policy

Rationale: A review of Block B syllabi revealed great disparity in the information provided to students regarding the GE requirements the course satisfies, the role of the course within Block B, and other content expected in course syllabi (*Faculty Handbook, Chapter V*).

Writing Assignments

GES recommends that an ad hoc committee, made up of representatives from GES and individuals who teach in Block B, be convened to review writing requirements in the Block B courses and make recommendations to help ensure that the writing requirements for GE courses are consistently followed in Block B.

Rationale: Campus policy mandates in GE courses the practice of writing and its evaluation (*Faculty Handbook, Chapter IV*). The former Writing Skills Subcommittee recommended that GE faculty should require more than one writing assignment, give students timely feedback on their writing, and make writing assignments a portion of the final grade (Memo from M. Garcia, March 12, 1997). In the student survey 73% of respondents agreed that each Block B course required a writing assignment. After a review of syllabi, GES is concerned about the wide variability across courses in the enforcement of this policy.

Student Learning Outcomes

GES recommends that the ad hoc committee also make recommendations that help ensure that faculty implement activities (e.g. active learning exercises, written assignments) that develop an appreciation in students about how the natural sciences enrich their lives and foster intellectual curiosity.

Rationale: Under the student learning objectives for Block B, students should 1) demonstrate basic knowledge of the natural sciences, 2) understand and employ the methodologies of the natural sciences, and 3) demonstrate how the natural sciences enrich their lives and foster intellectual curiosity (*General Education Assessment Plan, Goal 5, p. 7*).

Learning Objective 1: Students demonstrate basic knowledge of the natural sciences

Three indicators were used to assess this learning objective: (1) examination of course syllabi, (2) online survey of students in Block B courses and (3) assessment of student research papers in BIOL 155. Assessment of student research papers in BIOL 155 indicate that Block B courses make good contributions to this learning objective. In BIOL 155, students clearly exhibited increased skills in describing hypothesis testing and writing scientific research papers. During the draft stage of writing the scientific research papers, 64-67% of the students received full credit and at the final stage of the paper the proportion of students who received full credit increased to 87-90%. While the remaining two

indicators seem to support that Block B courses make good contributions to this learning objective, they were not appropriate assessment instruments for demonstrating basic knowledge of the natural sciences. The results from the examination of the course syllabi appeared to be quite favorable in that the reviewers believed that 91.1% of the syllabi reviewed supported this objective. While a syllabus identifies expected student learning outcomes and content, it is a weak indicator of the level of competencies and knowledge that a student will ultimately be able to demonstrate and as such it is not the most appropriate assessment instrument for measuring this objective. A review of the results of the online surveys of students in Block B courses revealed that 69% of the students agreed with the statement that “Block B courses increased my understanding of major achievements in the natural sciences.” This statement points to the students’ understanding and not their ability to demonstrate their basic knowledge in the natural sciences. As in the case of the syllabi review, this assessment instrument is not appropriate for assessing this objective.

Learning Objective 2: Students understand and employ the methodologies of the natural sciences

Examination of course syllabi, student survey data, interviews by the GE Assessment Coordinator of Block B faculty, and assessment of student research papers in BIOL 155 indicate that Block B courses make good contributions to this learning objective. While only 57.7% of syllabi reviewed showed evidence for this learning objective, 71% of students in the online survey agreed with the statement “Block B courses helped my understanding of what scientists do.” In addition, faculty reported in the interviews that students use the methodologies of the natural sciences to estimate the temperature of stars, to calculate an earthquake’s epicenter and to study the sex ratio of human groups. The BIOL 155 assessment showed that students gained skills in describing hypothesis testing, one of the methods used to understand the natural sciences.

Learning Objective 3: Students demonstrate how the natural sciences enrich their lives and foster intellectual curiosity

This learning objective had the weakest support and is the basis for our recommendation. Only 46% of students in the online survey agreed with the statement “Block B courses enriched my life,” and 50% agreed that “Block B courses increased my interest in science.” Only 48.2% of the syllabi reviewed showed that the syllabus provided evidence for this learning objective. These results may help to explain why in the alumni survey for GE program review only 61.2% of the alumni stated that GE courses (both lower division and upper division) contributed ‘Very much’ or ‘Quite a bit’ to their understanding of the natural sciences.

Faculty Development

GES recommends

- a. The development of a GE handbook as a guide for full-time and part-time faculty who teach GE courses.
- b. Holding meetings with new full-time and part-time GE faculty to educate them in the role of General Education at CSULA.

Rationale: Because of the concerns noted above about Block B course syllabi, writing assignments and student learning outcomes, GES believes faculty would benefit from a reference guide to the policies, recommendations and expectations for General Education at CSULA. Faculty meetings would help educate new GE instructors.

Courses Infrequently Taught

GES voted to decertify BIOL/PHYS 157 and PSCI 185 as GE courses in Block B and EPC approved the decertification of these courses.

Rationale: PSCI 185 was last taught in Spring 1999 and BIOL/PHYS 157 in Fall 2001. The departments do not plan to offer these courses in the future and no objections were received from the respective departments to decertify BIOL/PHYS 157 or PSCI 185.

APPENDIX A
Online Attitudinal Survey Results: GE Natural Science Courses – Block B
Cal State Los Angeles, Spring 2003

Faculty teaching Block B courses in Spring 2003 had their students take the online survey either during lab time or outside of class time for extra credit. 589 students participated.

	Yes	No
1. I am taking this course in Block B because of the GE requirements.	95%	5%
2. I have already completed the GE critical thinking requirement.	78%	22%
3. I have already completed the GE writing course (for example, English 101).	92%	8%
4. I have taken or am taking a biological sciences course with lab.	77%	23%
5. I have met this requirement by taking a course at another college or university.	16%	84%
6. I have taken or am taking a physical sciences course with lab.	62%	38%
7. I have met this requirement by taking a course at another college or university.	19%	81%
8. I have taken or am taking a course on the application of science & technology	66%	34%
9. I have met this requirement by taking a course at another college or university.	16%	83%
10. After completing the GE course in Block B that I am taking this quarter		
I will have finished GE requirements in Block B.	51%	
I will have to take one more course to finish GE requirements in Block B.	25%	
I will have to take two more courses to finish GE requirements in Block B.	10%	
I don't know how many more courses I have to take to finish GE requirements in Block B.	14%	

	SD	D	N	A	SA
11.1. Block B courses increased my understanding of major achievements in the natural sciences.	4%	3%	24%	50%	19%
11.2. Block B courses helped me to use the methods of the natural sciences.	3%	8%	29%	46%	13%
11.3. Block B courses enriched my life.	6%	10%	38%	34%	12%
11.4. Block B courses helped my understanding of what scientists do.	3%	5%	21%	53%	18%
11.5. Block B courses helped me to appreciate different disciplines and subject areas.	4%	5%	22%	52%	17%
11.6. Block B courses increased my interest in science.	8%	13%	30%	37%	13%
11.7. Each Block B course required or encouraged discussion.	4%	12%	32%	42%	11%
11.8. Each Block B course required a writing assignment.	3%	6%	16%	50%	23%
11.9. The overall educational quality of my Block B courses was excellent.	3%	6%	30%	48%	12%
11.10. I would recommend Block B courses to others.	6%	7%	27%	43%	17%
11.11. I chose Block B courses because of my interest in the topics.	12%	16%	29%	30%	13%
11.12. I chose Block B courses because they fit into my schedule.	9%	13%	24%	39%	15%

SD = strongly disagree **D** = disagree **N** = neutral **A** = agree **SA** = strongly agree

12. Have you attended only Cal State LA during your undergraduate career or did you transfer in?

Cal State LA 63% Transferred in 37%

13. Are you proficient in more than one language? Yes 73% No 26%

14. Sex: Female 71% Male 28%

15. Race/ethnicity: African-American 8% Asian/Pacific 18% Caucasian/White 11%

Latina/Latino/Hispanic/Latin American 54% Native American/American Indian 0%

Foreign 2% Other 6%

16. Age: Under 18 4% 18-20 38% 21-23 26%

24-26 13% 27-29 6% 30 or older 12%

Overview

The race/ethnicity of the students taking this survey was similar to the composition of the overall CSULA student body (*Cal State L.A. Facts #39*). However, students were more likely to have started college here, to be female and to be younger than the average CSULA undergraduate. Half were taking their last Block B course (item 10). GE policy states that writing be a part of all GE courses. Only 73% of students agreed or strongly agreed that writing assignments were required (item 11.8). Overall, 60% of students would recommend Block B courses to others (item 11.10).

Six items in the survey were designed to ask students about the GE objectives for student learning that were relevant to courses in Block B. Each objective was the focus for two items.

Goal 5. Students understand the distinct perspectives and major achievements in the natural sciences, the social sciences, and the arts and humanities (*General Education Assessment Plan*, p. 7).

Objective 1 – Students demonstrate basic knowledge of the natural sciences, the social sciences, and the arts and humanities, and an appreciation of their interrelationships.

11.1. Block B courses increased my understanding of major achievements in the natural sciences.
69% agreed or strongly agreed

11.5. Block B courses helped me to appreciate different disciplines and subject areas.
69% agreed or strongly agreed

Objective 2 – Students understand and employ the methodologies of the natural sciences, the social sciences, and the arts and humanities.

11.2. Block B courses helped me to use the methods of the natural sciences.
59% agreed or strongly agreed

11.4. Block B courses helped my understanding of what scientists do.
71% agreed or strongly agreed

Objective 3 – Students demonstrate an understanding of how the distinct perspectives of the major disciplines enrich their lives and foster intellectual curiosity.

11.3. Block B courses enriched my life.
46% agreed or strongly agreed

11.6. Block B courses increased my interest in science.
50% agreed or strongly agreed

As applied to the natural sciences, we conclude that Objective 3 had the weakest support from students who took the online survey. The responses for the other two objectives were much stronger.

APPENDIX B

Data on Block B Course Offerings Fall 1998 - Fall 2005

APPENDIX C
GE Course Syllabi in Block B: Natural Sciences
2006

The General Education Subcommittee (GES) asked departments in April 2006 to provide recent copies of course syllabi for Block B courses. The departments sent syllabi for 18 courses (ANTH 260, ASTR 151, ASTR 160, BIOL 155, BIOL 156, BIOL 158, BIOL 165, CE 220, CHEM 158, CHEM 159, GEOG 160, GEOG 170, GEOG 171, GEOL 150, GEOL 155, GEOL 158, MICR 151, and PHYS 156) and the lab manual for ASTR 152. Course syllabi were not available for BIOL/PHYS 157 and PSCI 185 because these courses had not been taught in over four years. Because, in some cases, more than one instructor taught the same course, a total of 28 syllabi were sent to GES.

Two members of GES reviewed each of the 28 course syllabi, generating a total of 56 reviews. Each reviewer looked for evidence in the syllabus that the course met the learning objectives, writing requirement and active learning requirement for GE courses in Block B. The reviewer also rated the syllabus for conformity with campus policy on the information expected in a syllabus. The numbers below give the percentage that each answer received out of the 56 reviews.

<u>Learning Objectives</u>	<u>Yes</u>	<u>No</u>	<u>Insufficient Evidence</u>
1. Students gain knowledge of the natural sciences	91.1%	3.6%	5.3%
2. Students understand and employ the methodologies of science	57.7%	8.9%	33.4%
3. Students understand how the natural sciences enrich their lives	48.2%	5.4%	46.4%
<u>Writing Criteria</u>			
4. More than one writing assignment	25.0%	60.7%	14.3%
5. Timely feedback early enough in the quarter so students can benefit e.g. multiple drafts, due date	21.4%	39.3%	39.3%
6. Writing assignments are graded and a percentage of the final grade	58.9%	32.2%	8.9%
<u>Active Learning</u>			
7. Students have the opportunity to be active learners e.g. class discussions, one-minute papers, group work, class presentations, research or creative projects	53.6%	3.6%	42.8%
<u>Syllabus Information</u>			
8. Syllabus identifies GE requirement the course satisfies e.g. block in lower division	23.2%	76.8%	0%
9. Syllabus gives a general course description	76.8%	23.2%	0%
10. Syllabus describes course objectives and a topical outline	73.2%	17.9%	8.9%

11. Syllabus describes other course requirements e.g. attendance, assignments, readings, grading, etc.	82.1%	17.9%	0%
12. Syllabus gives final exam and instructor information e.g. date & time of final exam, office hours, instructor's phone and office location	92.9%	0%	7.1%

Conclusions

Block B syllabi scored high in students gaining knowledge of the natural sciences (Item 1), describing course requirements (Item 11), and final exam and instructor information (Item 12). The high rating for Item 1 should be disregarded as the syllabus is not the most appropriate assessment instrument for measuring whether students gained knowledge of the natural sciences. While a syllabus identifies expected student learning outcomes and content, it is a weak indicator of the level of competencies and knowledge that a student gains and will ultimately be able to demonstrate.

Of the learning objectives, the one with the fewest “yes” and the most “insufficient evidence” ratings was Item 3, “Students understand how the natural sciences enrich their lives.” Many Block B courses may not meet the writing criteria for GE courses as indicated by the very low “yes” ratings for Items 4 – More than one writing assignment (25%) and 5 –Timely feedback ... (21.4%). Item 8 shows that most syllabi (76.8%) do not identify the course as belonging to Block B.

APPENDIX D

Interviews with Faculty Teaching Block B Courses

In Fall 2005 and Winter 2006 quarters the GE Assessment Coordinator (GEAC) met individually with seven faculty who taught Block B courses in the 2005-2006 academic year. He reported the results of these interviews to the General Education Subcommittee (GES). The seven faculty had taught a total of ten Block B courses: ASTR 151, ASTR 152, ASTR 160, BIOL 155, GEOL 150, GEOL 155, GEOL 158, GEOG 160, GEOG 170 and GEOG 171. In each interview the GEAC asked the same four questions listed below. Because it is one of the learning objectives, the GEAC specifically asked in Question 3 how students learn about the scientific method in Block B courses. The answers given below to Questions 1, 2, 3 and 4 were made by two or more faculty.

1. What do students do best in the Block B courses you teach?

- Understand basic concepts
- Anything that relates to their own experiences
- Hands on activities
- Field trips

2. What do students do worst in the Block B courses you teach?

- Quantitative reasoning: weak preparation in math, difficulty in mapping and calculations, simple division
- Poor background in chemistry
- Writing: a canned style that cuts and pastes
- Synthesizing course material: they can do a good playback but putting together concepts is harder
- Study time for the course

3. How do students learn about the scientific method in the Block B courses you teach?

- Application of lecture material to new conditions: estimation of star temperature, how seasons change
- Calculate epicenter of an earthquake
- Use graphs and equations to understand weather and climate
- Test hypothesis about the composition of human groups on campus
- Use Doppler shift to estimate distance to stars
- Map the boundaries of tectonic plates

4. Do you want to raise other issues about Block B courses?

- Facilities: need for more smart classrooms, poor condition of Physical Sciences building
- Large classes: more difficult to engage students in lecture, additional teaching credit is good
- Limited resources: could use more materials for lab, outdated equipment, support for field trip costs

Conclusions

Students do well at understanding basic scientific concepts and enjoy hands on activities. They often have poor quantitative and writing skills, as well as a weak background in chemistry. All the courses introduce students to the methodologies of science. The state of the classroom environment is a concern to faculty.

APPENDIX E
Assessment of Hypothesis Testing in BIOL 155
May 2006

BIOL 155 (Animal Biology) is a GE course in Block B, Natural Sciences. It fulfills the GE requirement in B1 for a class in the biological sciences with a lab. In calendar year 2005 1083 students enrolled in B1 courses, and 82.5% of them took BIOL 155. Thus, most students who need to complete B1 take this course. Two of the GE learning objectives for Block B are that (1) students demonstrate basic knowledge of the natural sciences and (2) students understand and employ the methodologies of the natural sciences. To measure student learning for these objectives, the General Education Assessment Coordinator (GEAC) employed an assessment of hypothesis testing embedded in BIOL 155. Development of this assessment was reported to members of General Education Subcommittee (GES) for their feedback.

One of the BIOL 155 lab assignments is writing a scientific research paper. The paper has four sections: Introduction, Materials and Methods, Results, and Discussion. Each week students turn in a draft for one of the sections, and the lab Teaching Assistant (T.A.) uses a set of rubrics to grade each draft. At the end of the quarter each student turns in a final version of the paper for grading that has all four sections. In Winter Quarter 2006 BIOL 155 students collected data on the composition of small groups on campus. They tested the hypothesis that individuals of the same gender randomly group together. The lab T.A.'s provided copies of their grading sheets for the research paper assignment to the GEAC.

Four grading rubrics (A, B, C and D) that applied specifically to hypothesis testing were used to assess student understanding of the scientific method. One rubric was for the Introduction, one for the Results, and two for the Discussion:

Rubric A- Introduction section states hypothesis to be tested,

Rubric B- Results section states what the statistical results imply about the original hypothesis,

Rubric C- Discussion section interprets the results of the current study, and

Rubric D- Discussion section summarizes the current findings in relation to previous work and states whether or not the current findings support or refute the original hypothesis.

None of the rubrics for the Materials and Methods section were used since these rubrics were not relevant to hypothesis testing. A summary of the grades (full, partial or no credit) for each rubric at the draft and final stages are provided below.

While T.A.'s for four of the lab sections voluntarily provided copies of the grading sheets, they were not consistent. During the draft stage of the research paper, 70 grading sheets for the Introduction (A) were turned in to the GEAC, only 57 for the Results (B), and 73 for the draft Discussion (C and D). When the final research paper was submitted, the number of grading sheets had dropped to 53 for all sections of the paper. This was not because students dropped the course; rather some T.A.'s failed to provide the GEAC with copies of their grading sheets. Thus, the sample sizes varied.

Rubrics and Results

Results for Rubric A - Introduction section states hypothesis to be tested.

	<u>Draft (N = 70)</u>	<u>Final (N = 53)</u>
Full credit	64.3%	90.5%
Partial credit	14.3%	3.8%
No credit	21.4%	5.7%

Results for Rubric B - Results section states what the statistical results imply about the original hypothesis.

	<u>Draft (N = 57)</u>	<u>Final (N = 53)</u>
Full credit	66.6%	90.5%
Partial credit	1.8%	3.8%
No credit	31.6%	5.7%

Results for Rubric C - Discussion section interprets the results of the current study.

	<u>Draft (N = 73)</u>	<u>Final (N = 53)</u>
Full credit	65.8%	86.8%
Partial credit	20.5%	7.5%
No credit	13.7%	5.7%

Results for Rubric D - Discussion section summarizes the current findings in relation to previous work and states whether or not the current findings support or refute the original hypothesis.

	<u>Draft (N = 73)</u>	<u>Final (N = 53)</u>
Full credit	67.2%	77.4%
Partial credit	16.4%	13.2%
No credit	16.4%	9.4%

Conclusions

At the draft stage about 64-67% of students received full credit. The remainder were not proficient. For the final stage of the paper the proportion that received full credit increased to 87-90%, suggesting that during the course BIOL 155 students gained skills in writing about hypothesis testing. The exception was Rubric D where only 77.4% received full credit, a gain of only 10.2%. This result suggests that about a quarter of students still had difficulty relating their findings to previous work and to the original hypothesis. Because of the differences in sampling size that resulted from a larger number of grading sheets being turned in for the draft stage than for the final stage, any comparison between draft and final papers can only be tentative.

APPENDIX F
GE Alumni Survey

Survey Conducted August 2004

Below is an excerpt from the GE alumni survey that was conducted for program review. Item 10 (g) asked alumni who graduated in 2003 with bachelor's degrees to rate the contribution of the GE program to their understanding of the natural sciences. 61.2% of the alumni stated that GE courses (both lower division and upper division) contributed 'Very much' or 'Quite a bit' to their understanding of the natural sciences.

10. To what extent did General Education courses that you took (including lower division courses and upper division theme courses) **contribute to your learning** in the following areas? (If you entered Cal State L.A. as a Freshmen, complete column (A) only; if you entered Cal State L.A. as a Transfer student, complete both column (A) and column (B), as applicable)

	(A) for ALL students: GE courses taken at Cal State LA				(B) for Transfer students: GE courses taken elsewhere			
	Very much	Quite a bit	Some	Very little	Very much	Quite a bit	Some	Very little
(a) Writing clearly and effectively N(A) = 372 N(B) = 299.....	38.4%	38.2%	17.5%	5.9%	39.8%	38.8%	17.7%	3.7%
(b) Speaking clearly and effectively N(A) = 369 N(B) = 299.....	31.2%	39.8%	21.1%	7.9%	35.8%	38.8%	20.7%	4.9%
(c) Thinking critically N(A) = 372 N(B) = 292.....	40.9%	36.8%	18.3%	4.0%	36.9%	42.5%	19.5%	2.0%
(d) Analyzing quantitative problems N(A) = 364 N(B) = 294.....	31.3%	36.0%	24.2%	8.5%	32.0%	38.1%	26.2%	3.7%
(e) Using computer/information technology N(A) = 369 N(B) = 290.....	30.1%	32.0%	25.2%	12.7%	30.0%	33.1%	24.5%	12.4%
(f) Understanding the political process involved in local, state, or national politics N(A) = 365 N(B) = 301.....	18.4%	31.5%	33.1%	17.0%	24.2%	33.6%	29.2%	13.0%
(g) Understanding the natural sciences N(A) = 371 N(B) = 299.....	21.6%	39.6%	27.5%	11.3%	23.8%	45.5%	24.4%	6.4%
(h) Understanding the humanities N(A) = 373 N(B) = 292.....	27.6%	41.8%	23.9%	6.7%	25.3%	43.2%	27.7%	3.8%