



**COMMITTEE ON ACADEMIC PLANNING AND REVIEW
ANNUAL PROGRAM REPORT**

College	CoS
Department	Biological Sciences
Program Unit	Biological Sciences
Reporting for Academic Year	2014-2015
Department Chair	Donald A. Gailey
Date Submitted	9/30/2015

1. SELF-STUDY (about 1 page)

A. Five-year Review Planning Goals

1. Increasing the number of non-tiered graduate courses for students pursuing a Master’s Degree.
2. Increasing the number of upper division laboratory courses offered in each of the options leading to a Bachelor of Science or Bachelor of Arts Degree
3. Offering hybrid courses that can be utilized in STEM education
4. Reinvigorating the Marine Science Degree and our relationship with the Moss Landing Marine Laboratories
5. Foster and maintain interest among students for the science field.
6. Increase the number of students applying and gaining acceptance into post-baccalaureate programs.
7. Faculty projections: one or two new physiologists, projected retirement of FRPr Dixon losing 0.5 FTE in microbiology
8. Stability of Chair position with Hedrick taking leave of absence 2011.
9. Stability of office management with 4 office managers in 4 years
10. Need for equipment replacement, new equipment

B. Five-year Review Planning Goals Progress

Note: Responses align with numbered points in “A” above

1. A new twist has invaded departmental discussions about, and assessment of, our Master’s programs—that being the transformation of our Master’s program to semesters. In several hours of “retreat” meeting devoted to our Master’s programs, some important planning decisions were made. The most important is the unanimous decision to maintain our M.S. as a research-based thesis as the capstone experience. Although there may be fiscal benefit to instituting/altering an M.A. that allows comprehensive examination as capstone, and increased numbers of enrollees might affirm the creation of more stand-alone 6000 courses, the department “stood by its guns” and voted to cancel the M.A. program. Although this could have been an avenue of advancement for K-12 teachers seeking advancement, the department agreed unanimously to add

“Research in Education” to the M.S. research possibilities (a new track that requires no “wet bench” lab research). We can expect enrollment increases relative to “STEM” by this new opportunity.

2. Thoughts of adding new laboratory-based UD major courses have been put aside for the more important work of restructuring all degree program, service and GE courses for semester format. Transition of any quarter course to a semester format will automatically increase the lab meeting hours by 50%.

3. Relative to STEM education, the department has added the “Biology Education Option” to its catalog B.A. program, preparing future Biology teachers for credentialing programs. The department is also participating in HOST lab course opportunities with the departments of Chemistry and Physics enabling lab instruction for middle school students (BIOL 3080).

4. Our alliance with MLML remains intact allowing us to list their courses in our catalog. The commute, however, remains the greatest impedance to greater participation by our students in MLML courses. Maintenance of the alliance is no-cost and the commitment should continue, no matter how “base-line” the current participation.

5. Yet again, the 2014 data show an increase in Biology enrollments. Yet again, we are impeded by building and space facilities in managing any further growth. With the campus commitment to supporting retention and graduation, proactive advising has been significantly simplified by opening the College of Science Student Service Center. The department is exceedingly happy with the efficiency and standardized processing of grad checks and referral to individual faculty members for career and course advising.

6. After discussion and analysis, rather than focus on our students gaining acceptance into post-baccalaureate programs, we need to focus on timely retention efforts and issuance of degrees, both in our baccalaureate and Master’s programs.

7. Increased enrollments have enabled two near-term faculty searches. We completed our search for a Microbiologist in the 14-15 AY, and we are carrying out a search for a cell and molecular specialist in the 15-16 AY. The department will pre-sage our next 5 year plan with a plan for new-faculty hiring to be completed this 15-16 AY.

8. The current chair (writer of this document) will likely announce retirement at the end of the 16-17 AY and the end of the current 3-year appointment.

9. Stability in departmental office management is no longer an issue with Ms. Granera currently at the helm. Frankly, she is an outstanding employee and the department risks losing her to an intra-campus promotion and new job (the risk one always takes with outstanding employees).

10. The department flourishes with new equipment as provided by A2E2 awards. It is imperative that our majors receive experience in cutting-edge technology. It is imperative that the university is made to understand that this is a “life blood” program to a department such as ours, and that there should be no structural change with the new provost.

C. Program Changes and Needs

This year’s consideration of “program changes and needs” has been both co-opted and consumed by transformation of our programs for semester conversion. So far this has led to a proposed reorganization of our B.S. degree program to a simpler two-concentration structure, Cell & Molecular vs. Integrative Biology, and a careful restructuring of our M.S. Program.

2. SUMMARY OF ASSESSMENT (about 1 page)

A. Program Student Learning Outcomes

Students graduating with a Biology B.A/B.S. from Cal State East Bay will be able to:

- 1 Demonstrate how evolutionary processes give rise to the diversity and unity of life, from genomes to ecosystems. (ILO 6)
 - 2 Explain the relationship between structure and function across all levels of biological organization, from ions to ecosystems. (ILO 6)
 - 3 Clearly communicate biological information in a variety of formats (written, oral, graphical, computational) using a style appropriate for the intended audience. (ILO 1, 2, 6)
 - 4 Apply methods of scientific inquiry—specifically, students will be able to formulate testable hypotheses, collect and analyze data, and report conclusions. (ILO 1,6)
 - 5 Gather, interpret, and evaluate published scientific information. (ILO 1,6)
- ll outcomes in the box below, and append a curriculum map showing alignment of the Program Student Learning Outcomes and CSUEB Institutional Learning Outcomes.

B. Program Student Learning Outcome(s) Assessed

This year, we focused on the content specific (rather than science skill based) SLOs.

- 1 Demonstrate how evolutionary processes give rise to the diversity and unity of life, from genomes to ecosystems. (ILO 6)
- 2 Explain the relationship between structure and function across all levels of biological organization, from ions to ecosystems. (ILO 6)

C. Summary of Assessment Process

We developed a Biology B.S./B.A. Capstone Assessment, in which we selected questions aligned with SLOs 1 and 2 from four published, nationally validated concept assessment tools in the areas of molecular genetics, evolutionary biology, physiology, and the scientific method. We revised some of the questions for clarity and format. This test was comprised of 25 multiple-choice questions, the majority (88%) of which focused on molecular genetics (14 questions) and evolution (8 questions), and 12% on physiology (2 questions) and the scientific method (1 question). The test was administered to 79 biology seniors during week 10 of Spring 2015. These students were enrolled in either BIOL 3151 (Principles of Animal Physiology) or BIOL 3130 (Principles of Evolutionary Biology)—courses in which biology seniors predominate. A few additional graduating seniors volunteered to take the test. The sample set of 79 students of senior standing was fairly robust, considering about 120 students, on average, graduate per annum with a B.S. or B.A. in biology.

D. Summary of Assessment Results

The mean overall score on the Biology Capstone Assessment was 15.4 out of 25 points, or 61.7%. Student performances were notably discrepant in the two major content areas, with a relatively strong performance on the evolution questions (mean 71.5%, SE 0.16) and a relatively poor performance on the molecular genetics questions (mean 55.4%, SE 0.26; Fig. 1). Student performances in the two minor content areas were also markedly discrepant, with an exceptional performance on the one scientific method question (mean 99%, SE 0.01)—all but one student answered this question correctly—and poor performances on the two physiology questions

(mean 48%, SE 0.10; Fig. 1). There were 8 questions that more than half of the students answered incorrectly. A review of these questions did not reveal any shared pattern, e.g., they were all written unclearly or they all demanded a higher level of critical thinking. However, the low student performances on these particular questions shed light on how effectively these concepts are reinforced in the curriculum. The solid student performances on the evolution questions and the scientific method question are indicative of the positive effect of the infusion of these concepts in nearly all biology courses taught in the department. The weak student performances on the molecular genetics questions are not surprising and reflect the level of exposure of our biology majors to these concepts, which are far more limited for those students who take few to no upper division cell/molecular biology courses beyond the principles (3000-) level, e.g., students in the Conservation/Ecology or Physiology Options. Molecular genetics is not woven through the biology curriculum as clearly and easily as evolutionary processes are. After all, evolution is the unifying principle of biology.

The results from the Biology Capstone Assessment tool have provided the following insights and informed the following changes to or ideas for improvement of the assessment plan for the B.S./B.A. in Biology:

- Continue to integrate and reinforce evolutionary biology in all courses in the curriculum;
- Improve the capstone assessment tool to include a more direct assessment of SLO 2;
- Administer the assessment tool to incoming biology majors to obtain a baseline measure of student competency in biology;
- Develop an additional assessment tool for measuring all B.A./B.S. Biology SLOs, e.g., key signature assignments administered in what we would call “Capstone Certified Courses,” which will be assessed using a standardized/shared rubric designed specifically for programmatic assessment of biology program SLOs;
- Continue to administer a Biology Capstone Assessment test that would be taken by each graduating senior in their “Capstone Certified Course;”
- Designate specific courses as potential “Capstone Certified Courses” and develop robust assignment and rubrics that will enable assessment of program SLOs.

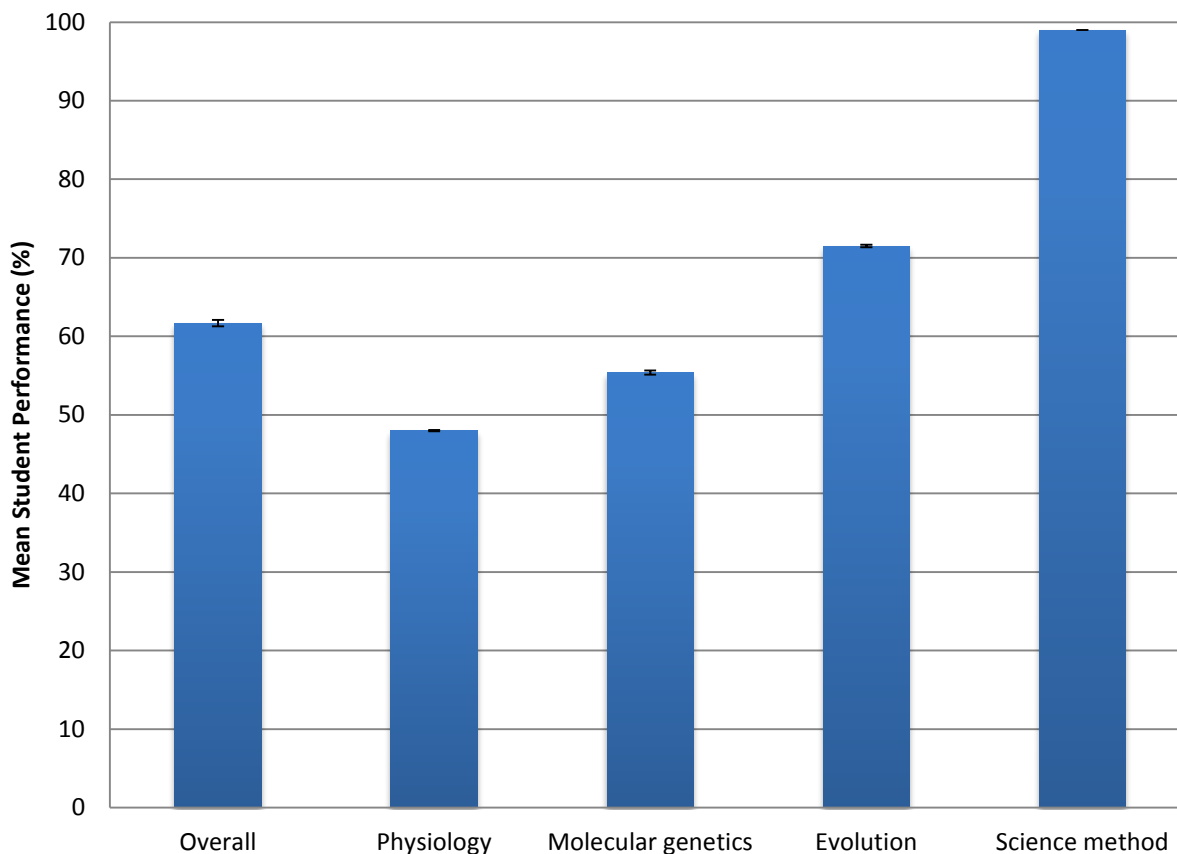


Figure 1. Student performance on the Biology BS/BA Capstone Concept Assessment. Overall scores and scores divided by content area are shown for n=79 senior biology majors. Error bars represent standard errors.

3. STATISTICAL DATA (about 1 page)

California State University, East Bay

APR Summary Data

Fall 2010 - 2014

Biological Science					
	Fall Quarter				
	2010	2011	2012	2013	2014
<i>A. Students Headcount</i>					
1. Undergraduate	525	574	658	680	768
2. Postbaccalaureate	28	9	5	2	1
3. Graduate	49	35	41	44	32
4. Total Number of Majors	602	618	704	726	801
	College Years				
<i>B. Degrees Awarded</i>					
	09-10	10-11	11-12	12-13	13-14
1. Undergraduate	100	91	91	133	103

2. Graduate	18	20	16	15	21
3. Total	118	111	107	148	124
	Fall Quarter				
	2010	2011	2012	2013	2014
C. Faculty					
Tenured/Track Headcount					
1. Full-Time	13	13	13	14	14
2. Part-Time	2	1	0	0	0
3a. Total Tenure Track	15	14	13	14	14
3b. % Tenure Track	88.2%	77.8%	72.2%	77.8%	77.8%
Lecturer Headcount					
4. Full-Time	0	0	0	1	2
5. Part-Time	2	4	5	3	2
6a. Total Non-Tenure Track	2	4	5	4	4
6b. % Non-Tenure Track	11.8%	22.2%	27.8%	22.2%	22.2%
7. Grand Total All Faculty	17	18	18	18	18
Instructional FTE Faculty (FTEF)					
8. Tenured/Track FTEF	13.1	10.7	11.0	11.7	11.0
9. Lecturer FTEF	3.6	4.1	6.4	6.2	7.1
10. Total Instructional FTEF	16.6	14.8	17.4	17.9	18.1
Lecturer Teaching					
11a. FTES Taught by Tenure/Track	325.9	327.6	315.1	322.2	317.1
11b. % of FTES Taught by Tenure/Track	86.5%	74.8%	63.6%	57.5%	57.3%
12a. FTES Taught by Lecturer	51.1	110.5	180.6	237.7	235.8
12b. % of FTES Taught by Lecturer	13.5%	25.2%	36.4%	42.5%	42.7%
13. Total FTES taught	377.0	438.1	495.7	559.9	552.9
14. Total SCU taught	5655.0	6571.0	7435.0	8398.0	8293.0
D. Student Faculty Ratios					
1. Tenured/Track	24.9	30.6	28.6	27.6	28.8
2. Lecturer	14.4	26.9	28.4	38.2	33.4
3. SFR By Level (All Faculty)	22.7	29.6	28.6	31.3	30.6
4. Lower Division	30.2	37.9	35.4	38.7	38.3
5. Upper Division	20.0	24.5	24.4	30.6	27.8
6. Graduate	7.6	12.5	13.7	10.3	7.5
E. Section Size					
1. Number of Sections Offered	99.0	97.0	103.0	108.0	109.0
2. Average Section Size	30.6	34.3	35.3	39.5	36.2
3. Average Section Size for LD	36.1	39.6	39.1	42.2	39.7
4. Average Section Size for UD	26.2	29.4	31.3	37.4	31.6
5. Average Section Size for GD	10.8	13.0	18.0	15.3	20.0
6. LD Section taught by Tenured/Track	20	13	8	15	14
7. UD Section taught by Tenured/Track	29	36	32	29	38
8. GD Section taught by Tenured/Track	30	22	24	29	18
9. LD Section taught by Lecturer	17	26	35	32	34
10. UD Section taught by Lecturer	4	1	5	5	7
11. GD Section taught by Lecturer	0	0	0	0	0

Source and definitions available at:

<http://www.csueastbay.edu/ira/apr/summary/definitions.pdf>

Important Notes:

1. We are bursting at the seams with majors. Our 2014 over 2013 data show an increase to 801 total majors, a 10% increase over 2013.
2. Our total degrees issued 2014 vs. 2013 shows a drop from 133 to 103. This could indicate an alarming drop in retention.
3. Our SFR remains alarmingly high at 38 compared with the systemwide BIOL department average of 22.
4. Our Master's program enrollment and graduation remains constant—consistent with the departmental decision to offer only the MS by thesis capstone. The number of MS students who are able to carry out thesis research is limited by the number of tenure-track faculty who have active research labs.
5. Our % FTES taught by lecturers remains high at 43%. This will likely be ameliorated by the addition of a new tenure-track faculty member who will be hired Fall 2016.

Please note, 2014 enrollment data by ethnicity were not currently retrievable on Institutional Research webpages. This will be rectified in the 2015-16 annual report.