

Assessment Report for BGES Undergraduate Programs in BIOLOGY: 12 June, 2007

1. Goals

Biology majors will possess a broad general knowledge of the fundamental facts and principles in all of the major areas of Biology by the end of their senior year, as well as advanced knowledge in the major areas of Biology, as defined by the GRE Advanced Biology subject test.

This goal was developed by the Department: initially by the chair and associate chairs, undergraduate program directors, and the Undergraduate Committee on Curriculum & Academic Standards [UCCAS], then discussed and approved by a formal vote at a faculty meeting. The decision to use the subject areas based on the areas of the Graduate Record Examination was made in 1996, when the first steps in Departmental assessment evaluations were begun. No changes in the goals have been made since that time.

2. Outcomes

The Department decided to define outcome measures as *satisfactory improvement in performance on a standardized test from entry to completion of the program*. This outcome measure was adopted by the Department in the same way and at the same time as the determination of the goals.

3. Research Methods

The current testing procedure (since Fall, 2001) uses an objective exam of 100 multiple-choice questions (randomly selected from a test bank of 900 questions), divided into 6 areas in the following proportions: 17% Biochemistry & Cell Structure/Function; 17% Genetics & Molecular Biology; 17% Evolution; 16% Ecology; 18% Botany; 15% Zoology. The first two areas were further subdivided. The questions used in the pool were selected from faculty input and then subsequently approved by faculty in each area.

In the first versions of the exam (administered through WebCT), the random sampling from the pool of questions for each category was done for each student. Severe problems with system backup/recovery in older versions of WebCT, which resulted in significant losses of data, forced us to adopt a simpler approach. We now perform the random sampling from the test bank only once each semester, so that all students in a given semester write the same exam.

The exam is administered at three time points (entry, early, and late) in a student's career: at entry, operationally defined as the beginning of the first required course for majors (BIO 200, Introductory Biology I), at the end of the introductory sequence (BIO 202, Introductory Biology II), and just before graduation. The last point is administered by requiring all majors to complete before graduation a zero-credit course (BIO 499, Exit Evaluation) that consists solely of the assessment examination. In the introductory biology sequence (BIO 200 & BIO 202), students are exposed to concepts in each of the six major areas into which the exam is subdivided. This allows us to attempt to assess both overall outcomes and performance in each of the subject

areas.

All of these direct measures are collected as aggregate values for the entire set of students writing the exam in each semester.

In addition to these direct outcome measures, indirect evidence sometimes comes in the course of informal exit interviews that arise during the last meeting before graduation that each major has with the Biology Undergraduate Program Director [in the BGES Department, all Biology majors are advised by the same person]. The suggestion by the assessment review panel for us to consider *systematic* indirect measures (such as a simple student survey) now has been implemented. When students take the exit examination, they also complete an anonymous survey; in addition, they are provided the opportunity to write any comments they wish. The survey instrument is attached to this document.

4. Findings

A set of standard statistics are calculated for each set of data and appropriate comparisons are made. In particular, overall average scores always are compared among the entry, early, and late categories as new data accumulate each semester. The latest data (from Fall, 2001, through Spring, 2007) show an appropriate increase in average (percentage) score from 27.5 at entry (based on data for N = 1190 students), to 33.5 at the end of the introductory sequence (N = 665 students), and 49.2 at exit (N = 170). The distributions of scores for 2006-07 are plotted in the attached graphs. Both the increase from the beginning to the end of the introductory sequence, and from then until exit are statistically significant (at a 95 % confidence level).

These results imply that there are measurable improvements in at least objective knowledge of biological facts and principles over the course of the introductory sequence, and that additional knowledge is acquired by Biology majors who graduate. Please note that the decrease in sample size at exit is a consequence of the fact that many students other than Biology majors *per se* take the introductory course sequence, while the exit exam is taken only by graduating Biology majors. Furthermore, there is non-trivial attrition of students from the first course in the introductory sequence to the second (a phenomenon that the Department is continuing to probe).

Summary results of the scores in each of eight subject areas (and also grouped by the six GRE categories as well as three broader categories) for the last three academic years are given in the attached spreadsheet. Exit test results for 105 Biology seniors who graduated in the last three academic years indicate that the lowest percentage scores (38.2 % correct) occur in questions related to Animal Biology [Zoology], and the next poorest performance (41.2 % correct) is in the area of Plant Biology [Botany]. In general, graduating seniors performed more poorly (41.6%) on questions related to Organismal Biology than on those related to Ecology & Evolution (50.0%) and Cell & Molecular Biology (55.8%).

Summary results of the first ten questions on the anonymous exit surveys are attached. On the five questions that attempt to solicit performance ratings, the mean values indicate that 35 graduating Biology seniors give the best ratings (1.74 and 1.77, respectively — closer to “good” than “very good”) to their own perceived knowledge and to their instructors’ abilities. The

lowest rating (2.40 — between “good” and “adequate”) was given to the quality of laboratory exercises.

Anonymous comments ranged from observations about individual instructors (both good and bad) to the general comment that one student got “a better education at CSU than Ohio State.” Suggestions for improvement included having “more night courses,” “more summer classes,” “more laboratory courses,” and “independent study should be required.”

5. Review

Results of the data analysis are reviewed each Fall by the Undergraduate Program Director, Associate Chairs, and Chair, as well as by members of the Department’s undergraduate committee (UCCAS). Any significant findings are reported to the faculty generally for discussion and action. Furthermore, all faculty receive copies of this report annually.

6. Actions

The results of both the direct and indirect assessment of student outcomes initially (in the early years of the Department’s assessment program) suggested a general performance weakness in the area of genetics. After discussion within the UCCAS, the Department discussed and adopted a curricular change involving the creation of a two new courses (BIO 310, Genetics, and BIO 311, Genetics Recitation) that now (since Fall, 2004) form part of the allowable core requirements for Biology majors.

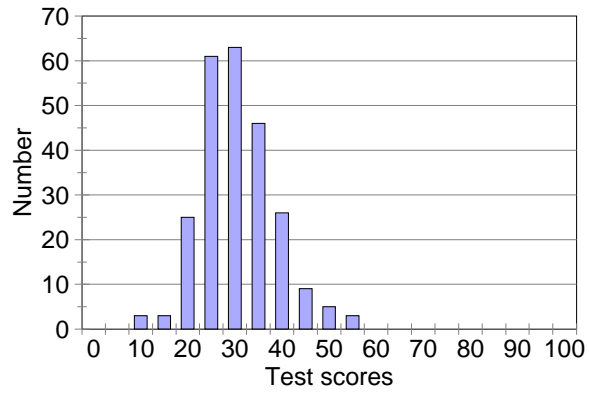
Anticipated difficulties in ensuring student compliance with taking the outcome assessment exam just before graduation resulted in the creation of the Exit Evaluation course requirement for the major, adopted in Fall, 2002 [after reluctant approval by the Arts & Sciences Curriculum Committee]. We now have very good compliance, and assessment instruments are administered routinely.

The newest finding, that of possible weaknesses in the areas of animal and plant biology, will become a subject for continuing faculty review and discussion. Possibly this is just a question of student interest and relative numbers of higher level courses taken closer to the exit exam. Similarly, perhaps some attention should be devoted to a focused review of laboratory exercises.

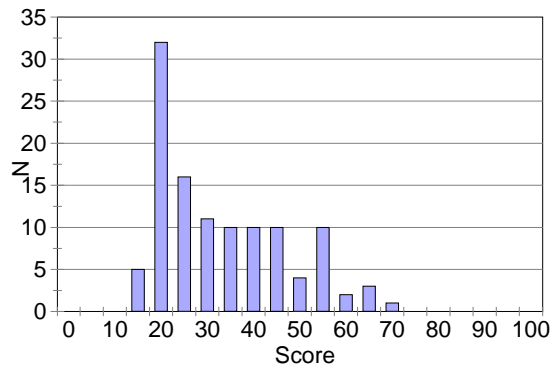
Several problems with the assessment routine itself involved maintaining routine administration of the exit survey. This problem is partly linked to the departure of our long-time departmental secretary with no overlap to train her replacement. It will be addressed as part of the discussion of this report.

No additional specific actions (other than the addition of an indirect assessment measure) were taken in Academic Year 2006-2007.

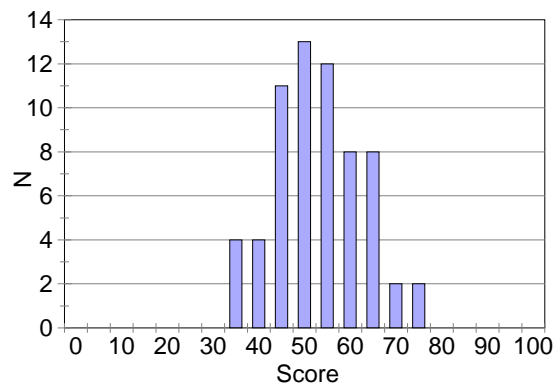
Bio 201



Bio 203



Bio 499



Assessment Report for BGES Undergraduate Programs in GEOLOGY: 12 June, 2007

1. Goals

Geology majors will possess a broad general knowledge of the fundamental facts and principles in all of the major areas of Geology by the end of their senior year, as well as advanced knowledge in the major areas of Geology, as defined by standard textbooks.

This goal was developed by the Department: initially by the chair and associate chairs, undergraduate program directors, and the Undergraduate Committee on Curriculum & Academic Standards [UCCAS], then discussed and approved by a formal vote at a faculty meeting. Because of the relatively small number of majors (less than 20) in the current program, the Department decided to use standard textbook topics as the knowledge base. No changes in the goals have been made since that time.

2. Outcomes

The Department decided to define outcome measures as *satisfactory improvement in performance on a standardized test from entry to completion of the program*. This outcome measure was adopted by the Department in the same way and at the same time as the determination of the goals.

3. Research Methods

The current testing procedure (implemented only since Fall, 2003) uses an objective exam of 65 multiple-choice questions. The questions used in the pool were selected from faculty input and then subsequently approved by faculty that teach in this area.

The exam is administered at two time points in a student's career: at entry, operationally defined as the beginning of the first required course for majors (GEO 100, Introductory Geology), and just before graduation. The last point is administered by requiring all majors to complete before graduation a zero-credit course (GEO 499, Exit Evaluation) that consists solely of the assessment examination.

All of these direct measures are collected as aggregate values for the entire set of students writing the exam in each semester. No attempt is made to track the performance of individual students, but this will become possible in future cohorts.

In addition to these direct outcome measures, indirect evidence sometimes comes in the course of formal exit interviews with the Geology Undergraduate Program Director [in the BGES Department, all Geology majors are advised by the same person] and the other two faculty in the program. The suggestion by the assessment review panel for us to consider *systematic* indirect measures (such as a simple student survey) now has been implemented. When students take the exit examination, they complete an anonymous survey, which was expanded this year to collect additional information on future plans; in addition, they are provided the opportunity to write any comments they wish. The survey instrument is appended to this document.

4. Findings

A set of standard statistics are calculated for each set of data and appropriate comparisons are made. In particular, overall average scores always will be compared between the entry and exit categories as new data accumulate each semester. The data so far (Fall, 2003, through the first Summer session, 2007) show an average score of 34.2% correct answers at entry (based on data for N = 1064 students: most of these are non-majors taking the course to satisfy Gen ed requirements). Unfortunately, only six students have completed the program who started after the mandatory exit evaluation was introduced (in Fall, 2003) and the exit exam scores for two of these are not yet available but we will try to recover these data. The average score was 74.2%.

It is clear that students in the introductory course have a poor initial knowledge of geological science facts and principles. At least four graduates have acquired a good knowledge of geology. However, three of these students were recipients of the Department's Thomas L. Lewis Memorial Award for Outstanding Graduating Geology Senior, so their scores necessarily are substantially above average!

Only two students completed the exit survey, and they rated their instructors highly ("very good" or "good"), their teaching assistants "adequate," and the laboratory courses "very good" or "good." Suggestions for improvement include having more research experience and more extracurricular activities. In written comments, one of the students would have liked more courses directly relevant to Northeast Ohio, and in the oral exit interviews with faculty, some students expressed an interest in having more field courses and better labs. Other points mentioned included: adding chemistry as a pre-requisite for geochemistry, making sure that core courses (mineralogy, petrology, paleontology, etc) are offered, and encouraging students to join the national geological organizations. Finally, they questioned the relevance of some Gen Ed courses for Geo majors.

5. Review

Results of the data analysis are reviewed each Fall by the Undergraduate Program Director, Associate Chairs, and Chair, as well as by members of the Department's undergraduate committee (UCCAS). Any significant findings are reported to the faculty generally for discussion and action. Furthermore, all faculty receive copies of this report annually.

6. Actions

There are too few results at exit and too few majors in this program to justify any actions at this time. However, it may be worthwhile to divide the exam into broad subject areas, so that future analyses may identify specific weaknesses in the objective knowledge of graduating Geology seniors.

Anticipated difficulties in ensuring student compliance with taking the outcome assessment exam just before graduation resulted in the creation of the Exit Evaluation course requirement for the major, approved in Spring, 2003.

Several problems with the assessment routine itself involve maintaining routine testing in entry courses and routine administration of the exam and exit survey (the exit interview with graduating seniors has a long tradition and continues to be done). The latter problem is partly

linked to the departure of our long-time departmental secretary with no overlap to train her replacement. Both of these problems will be addressed as part of the discussion of this report.

No additional specific actions were taken in Academic Year 2006-2007, although discussions of curricular changes and the future of the program and its service function have been initiated. The relationship of the program to the department's environmental science program is part of the discussion.

**Assessment Report for BGES Undergraduate Program in ENVIRONMENTAL SCIENCE:
12 June, 2007**

1. Goals

Environmental Science majors will possess a broad general knowledge of the fundamental facts and principles in all of the major areas of Environmental Science by the end of their senior year, as well as advanced knowledge in the major areas of Environmental Science, as defined by standard textbooks.

This goal was developed by the Department: initially by the chair and associate chairs, undergraduate program directors, and the Undergraduate Committee on Curriculum & Academic Standards [UCCAS], then discussed and approved by a formal vote at a faculty meeting. Because of the relatively small number of majors (less than 30) in a program that was initiated only in 2000, the Department decided to use standard textbook topics as the knowledge base. No changes in the goals have been made since that time.

2. Outcomes

The Department decided to define outcome measures as *satisfactory improvement in performance on a standardized test from entry to completion of the program*. This outcome measure was adopted by the Department in the same way and at the same time as the determination of the goals.

3. Research Methods

The current testing procedure (implemented only since Fall, 2003) uses an objective exam of 59 multiple-choice questions. The questions used in the pool were selected from faculty input and then subsequently approved by faculty that teach in this area.

The exam is administered at two time points in a student's career: at entry, operationally defined as the beginning of the first required course for majors (EVS 206, Introduction to Environmental Science), and just before graduation. The last point is administered by requiring all majors to complete before graduation a zero-credit course (EVS 499, Exit Evaluation) that consists solely of the assessment examination.

All of these direct measures are collected as aggregate values for the entire set of students writing the exam in each semester. No attempt is made to track the performance of individual students.

In addition to these direct outcome measures, indirect evidence sometimes comes in the course of informal exit interviews with the Environmental Science Undergraduate Program Director [in the BGES Department, all Environmental Science majors are advised by the same person]. The suggestion by the assessment review panel for us to consider *systematic* indirect measures (such as a simple student survey) now has been implemented. When students take the exit examination, they complete an anonymous survey; in addition, they are provided the opportunity to write any comments they wish. The current, revised survey instrument is appended to this document.

4. Findings

A set of standard statistics are calculated for each set of data and appropriate comparisons are made. In particular, overall average scores always will be compared between the entry and exit categories as new data accumulate each semester. The only data (Fall, 2003 through the first Summer session, 2005) show an average score of 27.4% (based on data for N = 109 students). During the past two academic years, part-time instructors and regular faculty members failed to administer the exam. Nine students have now completed the mandatory EVS exit evaluation that was introduced in Fall, 2003. Their average exit score was 70.2%.

It is clear that students in the introductory course have poor initial knowledge of environmental science facts and principles. At least eight graduating seniors have good objective knowledge of Environmental Science.

Only three students have completed the exit survey so far. They rated their instructors either “good” or “average,” and they rated both their teaching assistants and the laboratory courses from “bad” to “good.” Suggestions for improvement include having more hands-on research experience and better instructors. In written comments, one of the students would have liked internships that did not conflict with summer jobs.

5. Review

Results of the data analysis are reviewed each Fall by the Undergraduate Program Director, Associate Chairs, and Chair, as well as by members of the Department’s undergraduate committee (UCCAS). Any significant findings are reported to the faculty generally for discussion and action. Furthermore, all faculty receive copies of this report annually.

6. Actions

There are too few results for this program to justify any actions based on this formal assessment at this time. However, it may be worthwhile to divide the exam into broad subject areas, so that future analyses may identify specific weaknesses in the objective knowledge of graduating Environmental Science seniors. On-going review by the faculty has identified several needed improvements, including additional techniques courses and experience and a separation of majors and non-majors students in the introductory course. All of these issues are under discussion and will be addressed. Equipment for a needed laboratory in aquatic ecology has been purchased and will be introduced into courses next year. Staffing additional techniques courses will remain a problem. Course selection of non-major students may change with the revised Gen Ed requirements, alleviating the second problem.

Anticipated difficulties in ensuring student compliance with taking the outcome assessment exam just before graduation resulted in the creation of the Exit Evaluation course requirement for the major, approved in Spring, 2003. As a result, numbers of students completing the assessment exam at graduation have increased.

Several problems with the assessment routine itself involve maintaining routine testing in entry courses and routine administration of the exit survey. The latter is partly linked to the departure of our long-time departmental secretary with no overlap to train her replacement; the former is possibly linked to variable staffing of the introductory level courses with part-time and several

different full-time faculty, due to low faculty numbers in EVS. Both of these problems will be addressed as part of the discussion of this report.

The advisor for Environmental Science majors changed in Fall 2006. This eventually may result in greater student compliance, as well as greater faculty involvement in essential assessment activities.

No additional specific actions (other than the addition of an indirect assessment measure) were taken in Academic Year 2006-2007. As noted above, several changes will be discussed and possibly implemented in the coming year.

BGES Undergraduate Exit Survey

Today's Date: _____

Your Program (Bio, EVS, Geo): _____

1. What are your plans after graduation?
 - a) work at a job related to your degree program
 - b) work at some other kind of job, unrelated to your degree program
 - c) attend graduate or professional school
 - d) get another undergraduate degree
 - e) uncertain, or other plans

2. How would you rate your education in the BGES Department with respect to improving your job or career prospects?
 - a) very good
 - b) good
 - c) adequate
 - d) bad
 - e) very bad

3. How would you rate your education in the BGES Department with respect to improving your knowledge of the subjects covered in your courses?
 - a) very good
 - b) good
 - c) adequate
 - d) bad
 - e) very bad

4. What would be your overall rating of the ability of the instructors in your BGES lecture courses to explain the exercises and help you learn?
 - a) very good
 - b) good
 - c) adequate
 - d) bad
 - e) very bad

5. What would be your overall rating of the ability of teaching assistants in your BGES laboratory courses to explain the exercises and help you learn?
 - a) very good
 - b) good
 - c) adequate
 - d) bad
 - e) very bad

6. What would be your overall rating of the quality of the exercises or experiments in your BGES laboratory courses?
 - a) very good
 - b) good
 - c) adequate
 - d) bad
 - e) very bad

7. What do you think would be the best way to improve the BGES degree program that you took?
 - a) more modern or more exciting lecture courses
 - b) better instructors
 - c) better laboratory courses
 - d) more hands-on research experience
 - e) more extracurricular activities (student club, field trips, etc.)

8. What would be the second most important change that would improve the BGES degree program that you took?
 - a) more modern or more exciting lecture courses
 - b) better instructors
 - c) better laboratory courses
 - d) more hands-on research experience
 - e) more extracurricular activities (student club, field trips, etc.)

9. What would be the third most important change that would improve the BGES degree program that you took?
 - a) more modern or more exciting lecture courses
 - b) better instructors
 - c) better laboratory courses
 - d) more hands-on research experience
 - e) more extracurricular activities (student club, field trips, etc.)

10. Where will you live after you graduate?
 - a) northeast Ohio
 - b) elsewhere in Ohio
 - c) in a nearby state
 - d) somewhere else in the United States
 - e) In a different country

11. In five years where do you expect to be living?
 - a) In Northeast Ohio
 - b) In Ohio
 - c) In one of Ohio's neighboring states
 - d) Elsewhere in the United States
 - e) In a foreign country

12. What is your current career goal?
 - a) Health-related profession or research
 - b) Environmental science related work
 - c) Teaching at any level
 - d) Government service
 - e) Other

13. If your career plans are to work, will you
 - a) Continue to work at a job you have held for more than one year?
 - b) Continue to work at a job you have held for more less than one year?
 - c) Work at a job you have been offered?
 - d) Be looking for a job?
 - e) Other

14. If your career goal is a health-related profession, please describe:
 - a) Medicine, dentistry, veterinary medicine
 - b) Pharmacy
 - c) Occupational or Physical Therapy
 - d) Biomedical research
 - e) Other

15. If your plans involve further education, what is the status if your plans?
 - a) Accepted to a program of your choice
 - b) Applied and waiting or a decision
 - c) Identifying possible programs
 - d) Other

16. If your plans involve further education, what is your intended program?
 - a) Professional program (medicine, dentistry, veterinary medicine)

- b) Doctoral program
- c) Masters program
- d) Business, law
- e) Other

If you plan to pursue a graduate or professional education, please answer questions 17 to 24 on the sources of information that were most important in guiding your choice of institution and program.

Use the following scale:

- a) most important,
- b) very important,
- c) important,
- d) consulted or considered but neither useful nor important,
- e) not consulted]

- 17. Internet information from the program website.
- 18. Internet information from general websites (e.g., www.gradschools.com, www.aamc.org or ranking services, e.g., USNews.com)
- 19. Posters or other displayed information.
- 20. Printed information (brochures, catalogs), whether unrequested (i.e., advertising) or received by request.(i.e., you asked to have them sent)
- 21. Personal contacts (e.g., faculty, friends, fellow students)
- 22. Personal constraints (e.g., family considerations, friends)
- 23. Regional constraints or desires, i.e., city or location where you would like to live.
- 24. Financial constraints (e.g., tuition, living expenses, financial aid or assistantships offered)

The department would like to track its graduates; please keep us informed of your education and jobs as your career progresses. Send us an email at bges@csuohio.edu

Today's date: _____

Your Program (Bio, EVS, Geo): _____

Anonymous Exit Comments for BGES Undergraduate Degree Programs

Please write down any comments that you care to make about the program. These can be specific comments about particular courses or instructors, or they can be general comments. They can be positive or negative- whatever you feel is worth mentioning. We want to know whether or not you had good experiences, and we particularly want to know what might be done to improve the program. Thanks!

Assessment results

area		# questions	# questions									
			F01	S02	M02-A	M02-B	F02	S03	F03	S04	F04	S05
biochemistry	I	7						0.419	0.243	0.379	0.256	0.359
cell biology	I	10						0.431	0.206	0.216	0.223	0.217
genetics	I	17						0.433	0.237	0.333	0.217	0.267
evolutionary mechanisms	III	17						0.486	0.334	0.423	0.331	0.316
evolutionary diversity	II	8						0.410	0.318	0.467	0.295	0.334
plant form & function	II	10						0.315	0.267	0.472	0.259	0.314
animal form & function	II	15						0.357	0.269	0.346	0.272	0.255
ecology	III	16						0.271	0.303	0.340	0.283	0.240
Cell & Molecular	I	34						0.429	0.229	0.308	0.227	0.271
Organismal	II	33						0.357	0.280	0.414	0.274	0.292
Ecology & Evolution	III	33						0.382	0.319	0.383	0.308	0.279
Total		100	0.273	0.376	0.348	0.38	0.266	0.390	0.276	0.368	0.269	0.281
N			99	88	27	19	158	100	181	123	219	104

Sample

Weighted average

NOTES:

reliable WebCT version starts F01 (randomized per student; no category data available)

paper version (fixed for year) starts S03

fixed WebCT version starts M04

BIO 499 approved F02, scheduled starting S03

first BIO 499 registration S04 (9 students of 17 who took test in S04)

update: **26 May 2007**

F05	S06	F06	S07	AY04-current		Exit F01 & F02	AY04	AY05	AY06	AY07	A)
				BIO 20C average	BIO 202 average						
							499	499	499	499	
0.256	0.361	0.260	0.349	0.255	0.362		0.558	0.789	0.709	0.756	
0.218	0.247	0.227	0.206	0.219	0.222		0.368	0.448	0.484	0.475	
0.237	0.345	0.244	0.297	0.234	0.312		0.476	0.567	0.540	0.577	
0.329	0.423	0.357	0.362	0.338	0.383		0.455	0.555	0.525	0.548	
0.295	0.486	0.313	0.403	0.305	0.426		0.358	0.56	0.489	0.490	
0.249	0.442	0.260	0.324	0.258	0.392		0.418	0.42	0.412	0.406	
0.273	0.385	0.285	0.291	0.275	0.322		0.464	0.384	0.370	0.365	
0.283	0.312	0.307	0.280	0.293	0.295		0.398	0.443	0.497	0.480	
0.236	0.320	0.242	0.281	0.234	0.296		0.461	0.578	0.558	0.584	
0.271	0.427	0.284	0.328	0.277	0.368		0.424	0.438	0.412	0.408	
0.307	0.369	0.332	0.322	0.316	0.341		0.427	0.501	0.511	0.515	
0.271	0.371	0.286	0.310	0.275	0.335	0.48	0.438	0.506	0.494	0.503	
262	117	244	114	906	458	21	22	25	58	65	
				1190	665				126		
				0.276	0.350				0.483992		
				1497	1855						

Y04-current

BIO 499

average

GRE areas

0.719

0.461 0.567 biochem & cell

0.550 0.550 genetics & molec. biol.

0.529

0.483 0.514 evolution

0.412 0.412 botany

0.382 0.382 zoology

0.470 0.470 ecology

0.558

Cell & Molecular

0.416

Organismal

0.500

Ecology & Evolution

0.492

170

Assessment results
 update: **26 May 2006**
 area

	category	# questions	BIO 200 F03	BIO 202 S04	BIO 200 F04	BIO 202 S05	BIO 200 F05
biochemistry	I	7	0.243	0.379	0.256	0.359	0.256
cell biology	I	10	0.206	0.216	0.223	0.217	0.218
genetics	I	17	0.237	0.333	0.217	0.267	0.237
evolutionary mechanisms	III	17	0.334	0.423	0.331	0.316	0.329
evolutionary diversity	II	8	0.318	0.467	0.295	0.334	0.295
plant form & function	II	10	0.267	0.472	0.259	0.314	0.249
animal form & function	II	15	0.269	0.346	0.272	0.255	0.273
ecology	III	16	0.303	0.340	0.283	0.240	0.283
Cell & Molecular	I	34	0.229	0.308	0.227	0.271	0.236
Organismal	II	33	0.280	0.414	0.274	0.292	0.271
Ecology & Evolution	III	33	0.319	0.383	0.308	0.279	0.307
Total		100	0.276	0.368	0.269	0.281	0.271
N			181	123	219	104	262

BIO 202 S06	AY04-current		Exit results			AY04-current		GRE area	category
	BIO 200 average	BIO 202 average	AY04 BIO 499	AY05 BIO 499	AY06 BIO 499	BIO 499 average			
0.361	0.253	0.367	0.558	0.789	0.709	0.697		I	
0.247	0.216	0.227	0.368	0.448	0.484	0.451	0.552	I	
0.345	0.230	0.317	0.476	0.567	0.540	0.533	0.533	I	
0.423	0.331	0.391	0.455	0.555	0.525	0.518		III	
0.486	0.301	0.434	0.358	0.56	0.489	0.479	0.505	II	
0.442	0.257	0.414	0.418	0.42	0.412	0.415	0.415	II	
0.385	0.272	0.332	0.464	0.384	0.370	0.393	0.393	II	
0.312	0.289	0.301	0.398	0.443	0.497	0.463	0.463	III	
0.320	0.231	0.301	0.461	0.578	0.558	0.543		I	
0.427	0.275	0.381	0.424	0.438	0.412	0.420		II	
0.369	0.311	0.347	0.427	0.501	0.511	0.491		III	
0.371	0.272	0.343	0.438	0.506	0.494	0.485			
117	662	344	22	25	58	105			

GRE areas

biochemistry & cell biology
genetics & molecular biology

evolution
botany
zoology
ecology

Cell & Molecular
Organismal
Ecology & Evolution

Assessment results

		# questions	F01	S02	M02-A	M02-B	F02
area							
biochemistry	I	7					
cell biology	I	10					
genetics	I	17					
evolutionary mechanis	III	17					
evolutionary diversity	II	8					
plant form & function	II	10					
animal form & function	II	15					
ecology	III	16					
Cell & Molecular	I	34					
Organismal	II	33					
Ecology & Evolution	III	33					
Total		100	0.273	0.376	0.348	0.38	0.266
N			99	88	27	19	158

Sample

Weighted average

S03	F03	S04	F04	S05	F05	S06	F06	S07
0.419	0.243	0.379	0.256	0.359	0.256	0.361	0.260	0.349
0.431	0.206	0.216	0.223	0.217	0.218	0.247	0.227	0.206
0.433	0.237	0.333	0.217	0.267	0.237	0.345	0.244	0.297
0.486	0.334	0.423	0.331	0.316	0.329	0.423	0.357	0.362
0.410	0.318	0.467	0.295	0.334	0.295	0.486	0.313	0.403
0.315	0.267	0.472	0.259	0.314	0.249	0.442	0.260	0.324
0.357	0.269	0.346	0.272	0.255	0.273	0.385	0.285	0.291
0.271	0.303	0.340	0.283	0.240	0.283	0.312	0.307	0.280
0.429	0.229	0.308	0.227	0.271	0.236	0.320	0.242	0.281
0.357	0.280	0.414	0.274	0.292	0.271	0.427	0.284	0.328
0.382	0.319	0.383	0.308	0.279	0.307	0.369	0.332	0.322
0.390	0.276	0.368	0.269	0.281	0.271	0.371	0.286	0.310
100	181	123	219	104	262	117	244	114

A

AY04-current		Exit	AY04	AY05	AY06	AY07
BIO 200	BIO 202	F01 & F02	499	499	499	499
average	average					
0.255	0.362		0.558	0.789	0.709	0.756
0.219	0.222		0.368	0.448	0.484	0.475
0.234	0.312		0.476	0.567	0.540	0.577
0.338	0.383		0.455	0.555	0.525	0.548
0.305	0.426		0.358	0.56	0.489	0.490
0.258	0.392		0.418	0.42	0.412	0.406
0.275	0.322		0.464	0.384	0.370	0.365
0.293	0.295		0.398	0.443	0.497	0.480
0.234	0.296		0.461	0.578	0.558	0.584
0.277	0.368		0.424	0.438	0.412	0.408
0.316	0.341		0.427	0.501	0.511	0.515
0.275	0.335	0.477	0.438	0.506	0.494	0.503
906	458	21	22	25	58	65
1190	665				126	
0.276	0.350				0.483992	
1497	1855					

\Y04-current
BIO 499
average

GRE areas

0.719	
0.461	0.567 biochem & cell
0.550	0.550 genetics & molec. biol.
0.529	
0.483	0.514 evolution
0.412	0.412 botany
0.382	0.382 zoology
0.470	0.470 ecology
0.558	Cell & Molecular
0.416	Organismal
0.500	Ecology & Evolution
0.492	
170	