

University of Georgia

2013 College Basic Academic Subjects Examination Report

The College Basic Academic Subjects Examination (CBASE)

The College Basic Academic Subjects Examination (CBASE) is a criterion-referenced academic achievement examination that assesses students' knowledge and skills in the subject areas of English, social studies, science, and mathematics, as well as their performance in certain higher order thinking skills (interpretive reasoning, strategic reasoning, and adaptive reasoning) that are meant to be acquired in the first two years of undergraduate study. Students are typically tested after completion of a college-level core curriculum. The standard 180-item multiple-choice instrument comprises one test in each of the four subject areas. The knowledge and skills tested align well with general education competencies and outcomes defined for UGA students in the Core Curriculum areas of Foundation Courses; World Languages and Cultures, Humanities and the Arts; Sciences; Quantitative Reasoning; and Social Sciences. There is an optional essay writing exercise included in the English subject area exam. The Assessment Resource Center (ARC)¹ gives campuses the option to use the full assessment with individual students, or to administer one subject test (35-56 items per test) each to a larger number of students. In the latter case, the ARC provides guidance for sample selection to achieve sufficiently representative numbers. This method saves time, and is typically more feasible for student, professor and administrative staff schedules.²

¹ The Assessment Resource Center (ARC) developed and administers the CBASE. The ARC is located in the College of Education at the University of Missouri—Columbia.

² For more information, consult *College BASE brochure*. Assessment Resource Center, University of Missouri—Columbia. Retrieved June 29, 2013, from http://arc.missouri.edu/PDFs/CBASE_%20folder_for_the_web_final.pdf

UGA 2013 Test Administration

During March and April 2013, 529 UGA undergraduate students participated in CBASE testing. UGA assessment staff from the Office of Academic Planning administered the standard test form in nineteen upper-division courses representing eleven schools and colleges³. The Office of Academic Planning (OAP) recruited students with the assistance of the deans of each school and college. The deans provided a selection of courses enrolling primarily juniors, as those students are the most likely to have completed or to be completing core courses. The OAP then contacted those professors to invite their participation and to determine availability. Students in selected courses were not required to participate and a small number chose not to take the test. In a few cases, students who were enrolled in more than one of the participating courses and had already completed one test were excused from the second testing session. Subject tests were randomly assigned and evenly distributed in each of the testing sessions. Of the 529 completed subject tests, 138 were in English, 131 in mathematics, 129 in science, and 131 in social studies. Participants were given 45 minutes, after instructions, to complete one paper and pencil subject test. Students were not required to complete the writing exercise included in the English subject area of the exam. The OAP returned all completed subject tests to the Assessment Resource Center (ARC) for scoring in spring 2013, and received the institutional summary report back from ARC in summer 2013.

Results and Analysis

The institutional summary report identifies strengths and weaknesses of UGA students as a group in terms of general education knowledge and skills. The Subject Scores are indicators of traditional general education skills and knowledge in the areas of English, mathematics, science and social studies. Subjects are then divided into more specific levels of Clusters and Skills. Cluster

³ College of Family and Consumer Sciences, Grady College of Journalism and Mass Communications, Odum School of Ecology, Franklin College of Arts and Sciences, College of Public Health, Warnell School of Forestry and Natural Resources, School of Social Work, Terry College of Business, College of Engineering, College of Environment and Design, College of Education

scores indicate how well students perform on a group (cluster) of closely related skills and are reported with averages and standard deviations. Skills scores represent proficiencies in 23 clearly defined concepts and abilities necessary for success in each of the subjects and are divided into high, medium and low ranges. The institutional summary report displays the median score and standard deviation for each CBASE Subject and Cluster. Lastly, the Composite Score represents the mean of the institutional Subject Scores. All scores are based on a 40 to 550 scale, with 300 being the mean for all participating institutions. Appendix A indicates where to locate the various scores in the institutional summary report.

The breakdown of scores just described allows for different ways of examining student capabilities. UGA can compare the Subject, Cluster, and Composite scores and in any such comparison, according to the *CBASE Interpretive Guidelines*, a difference of 17 points among the scores can be considered meaningful. Table 1 lists UGA student scores for the four subject areas and the overall composite score:

TABLE 1: UGA Mean Scores on the 2013 CBASE

Subject	UGA Mean	UGA Standard Deviation
Composite Score	319	NA
English	291*	55
Mathematics	310	66
Science	344*	54
Social Studies	327	46

**Score is meaningful.*

UGA’s composite score of 319 is within one standard deviation of the exam’s mean of 300. This means that 68 percent of UGA students scored between 278 and 408, suggesting an overall strong performance by our students compared to all students who took the test this year at other institutions. A comparison of aggregate subject scores to the composite score indicates relative strength in science (positive difference of 25 points), and relative weaknesses in English (negative

difference of 28 points from the composite score). The mathematics and social studies mean scores are not found to be significant since there is less than 17 points difference from the composite score. It must be noted that while UGA students scored *relatively* less well in English compared to the composite score, they still scored above the national scores in all subject areas. Comparisons to similar institutions will be discussed later in this report. Subject scores are analyzed in more detail below.

Mathematics

UGA's mathematics score reports a mean score of 310, with a standard deviation of 66. UGA students performed well in the competency category of General Mathematics, scoring an average of 341 (s.d. = 54). UGA students do relatively well in each of the three cluster areas, *practical applications, properties and notations, and using statistics*, with 92%, 97%, and 92% in the combined medium and high groups, respectively. UGA students also performed relatively well in Algebra (m = 328 s.d. = 64), with the majority of students performing in the high or medium categories in *evaluating expressions* (H 34%; M 54%), and *equations & inequalities* (H 27%; M 63%) cluster areas. A relative weakness is indicated in Geometry, with an average score of 290, a score of 20 points below the mean for the overall mathematics category. UGA students demonstrated particular difficulties with *2- & 3-dimensional figures* (L 29%) and *geometrical calculations* (L 21%). The lower scores in this area may be due to the fact that at UGA, Geometry courses are not offered as part of the core curriculum and therefore many CBASE participants may have been at a disadvantage in this area.

Science

UGA students performed particularly well in science. With a mean score of 344 and standard deviation of 54, this shows that 68 percent of our students earned scores between 290 and 398, mostly above the national mean. Students demonstrated relative strengths in both areas;

laboratory and fieldwork (m = 342; s.d. = 48, and *fundamental concepts* (m = 336; s.d. = 53). All cluster areas in *laboratory & fieldwork* had at least 95% of students score in the medium or high range. In the *fundamental concepts* cluster areas, at least 89% of students fell into the medium or high range.

English

UGA students performed the least well in English, with a mean overall score of 291 (s.d. = 55), which is 28 points below the composite score. Participants demonstrated the most difficulty in the competency category of Reading & Literature, scoring an average of 285 (s.d. = 58). Scores indicate difficulty in all three cluster areas; *reading critically* (H 20%; M 50%; L 30%), *reading analytically* (H 26%; M 48%; L 26%), and *understanding literature* (H 18%; M 57%; L 25%). Although participants did not complete the writing exercise, the skills of *writing as a process* and *conventions of written English* were captured in some of the test items. The scores discussed here were calculated *without* the writing exercise. UGA students performed about average in this area, scoring a 310 with a smaller standard deviation (s.d. = 46). This score is 9 points below the composite score, and thus not considered meaningfully different. However, it is worth noting that students largely performed in the high and medium categories in the *conventions of written English* competency area.

Social Studies

In the subject matter of social studies, UGA students performed slightly above the composite score (m = 327; s.d. = 46), however these differences are not significant. UGA students do relatively well in each of the clusters; *history* (m = 313; s.d = 47) and *social sciences* (m = 329; s.s. = 41), with between 92% and 96% of students performing at the medium and high level in each of the cluster areas. While no one social studies cluster score is significantly higher or lower than the composite, this shows the UGA students are performing adequately in this area.

UGA Comparison Summary (2003-2013)

The University of Georgia has participated in the CBASE examination four times: in 2003, 2007, 2010, and 2013. The following table lists UGA mean scores from 2003, 2007, 2010, and 2013 administrations of the CBASE exam. Meaningful mean scores are indicated by the notation (^c) if significant to the Composite Score, and by (^s) if significant to the Subject Score with in each given year.

TABLE 2: UGA Mean Scores on the 2003, 2007, 2010, 2013 CBASE

Subject	Ability Cluster	2003 N=612	2007 N=601	2010 N=626	2013 N=529
Composite Score		332	337	343	319
English		328	328	320^c	291^c
	Reading & Literature	317	315 ^c	316 ^c	285 ^c
	Writing	331	333	335	310 ^s
Mathematics		331	325	362^c	310
	General Math	325	344 ^s	357	341 ^{sc}
	Algebra	340	338	360 ^c	328 ^s
	Geometry	308 ^{sc}	297 ^{sc}	342 ^s	290 ^{sc}
Science		331	344	363^c	344^c
	Lab & Field Work	332	335	350	342 ^c
	Fundamental Concepts	319	345	355	336 ^c
Social Studies		336	349	324^c	327
	History	333	347	320 ^c	313
	Social Sciences	331	340	324 ^c	329

c = significant difference with the Composite Score

s = significant difference with the Subject score

Note that although composite scores progressively increased until 2010 there are no significant differences in composite scores over the first three test administrations. Scores from the 2013 administration, however, are significantly different in some subjects. While scores in science are significantly higher, scores significantly decreased in English and mathematics. Are UGA

students declining in the areas? Readers should be cautioned against making this interpretation.

Lower scores are most likely due to the smaller sample of students in 2013, to be considered further in the discussion to follow. The possibility of oversampling in some disciplines may also contribute to score differences. Students often chose majors to fit their particular strengths, and if, for example science majors were oversampled it might affect scores on that subject test.

Institutional Comparisons

The Assessment Resource Center provides a report on comparative/comparable institutions for the University of Georgia. Comparing UGA's mean scores with the aggregate scores for these institutions can be instructive, though care should be taken in making conclusions about UGA student performance based on these comparisons. The ARC does not provide clear criteria on how these comparative institutions were chosen, and thus the reader should exercise caution in considering using these institutions as a kind of benchmark. Additionally, no information on sample demographics is provided. It should be noted that only one of these institutions—University of Missouri-Columbia—is on the UGA Comparator Institutions list, and none of the institutions are on UGA's list of aspirational peer institutions. Comparative scores are aggregated from all of the following ten institutions; individual institutional scores are not provided.

1. Jackson State University
2. Missouri University of Science & Tech.
3. St. Louis University
4. University of N Carolina at Pembroke
5. University of Missouri-Columbia
6. University of Missouri-Kansas City
7. University of Missouri-St. Louis
8. Washington University
9. Wichita State University

TABLE 3: Mean Scores for UGA and Comparative Institutions 2013 CBASE

Subject	Ability Cluster	UGA 2013	Comparative Institutions	Score Difference
Composite Score		319*	278	65^
English		291^{c*}	263	28
	Reading & Literature	285 ^{c*}	264	21
	Writing	310 ^{s*}	274	36
Mathematics		310*	284	26
	General Math	341 ^{sc*}	288	53
	Algebra	328 ^{s*}	291	37
	Geometry	290 ^{sc}	283	7
Science		344^{c*}	292	52
	Lab & Field Work	342 ^{c*}	297	45
	Fundamental Concepts	336 ^{c*}	292	44
Social Studies		327*	271	56
	History	313*	277	36
	Social Sciences	329*	276	53

c = significant difference with the Composite Score

s = significant difference with the Subject Score

* = significant difference with Comparison Institutions Scores in the same row

^ = Score is different by at least one standard deviation (SD = 65).

Note that UGA students scored significantly higher in the composite score, as well as all of the subject scores. Additionally, when looking at the Institutional Comparison Report (Appendix B), UGA's scores reflect much higher percentages of students scoring in the high and medium levels, and very few scoring in the low level for competencies across the subject areas, as compared to students in the comparative institutions.

Use and Limitations

According to the Assessment Resource Center, the CBASE can be used for three main purposes: to compare to other institutions, as a longitudinal study of educational performance at an institution, and as a value-added measure of student learning. UGA uses CBASE for the first two of these purposes. The CBASE is a professionally developed, standardized test with established

validity and reliability that allows UGA to make national comparisons. The use of standardized tests like CBASE also has limitations. One consideration in using the CBASE is that it is a criterion-referenced test, meaning that it assesses students' mastery of pre-determined knowledge sets. Standardized tests generally face the challenge of not matching up precisely with an individual institution's learning outcomes or curriculum. While the CBASE knowledge sets are *generally* aligned with the competencies defined for UGA's general education curriculum, the curriculum allows for some degree of individual variability in course selection; therefore, students' individual course taking patterns, transfer credits, and advanced placement credits likely account for some variations in scores. For this reason, the CBASE results at UGA may serve best as an overall measure of student attainment across the general education curriculum rather than a precise measure for individual competencies.

Particular limitations associated with administration of the CBASE on the UGA campus include difficulty in sample selection and adequate representation of the student body. Because funds for recruitment and participant motivation are limited, and such a large number of students must be tested, it is impossible to recruit a perfectly representative sample. Due to these challenges, test administration in scheduled courses was determined to be the most effective method. Every effort was made to recruit a diverse sample of upper-division courses across majors. However, such a protocol relies heavily upon the assistance of deans' offices to make the request of professors and for professors, in turn, to be able to accommodate the test in their course schedules. The smaller sample size in 2013 is very likely the most limiting factor. And as discussed previously, it is possible that some majors were over- or underrepresented in the participant samples.

Also, as in past administrations, the challenge of time constraints in the classroom may well have affected scores. CBASE recommends 45 minutes for each subject area of the test, and our protocol for the 2013 administration, as with previous administrations, requested an hour of class

time for test administration. Most students were able to finish in that amount of time, but students arriving late may have rushed or turned in an incomplete exam. Proctors examined answer booklets as they were submitted to confirm that most items were attempted. Some cases were eliminated from the final pool if less than half of the test section was completed or if a test was turned in within twenty minutes (less than half of the allotted testing time).

In summary, while there are advantages to the use of CBASE for assessing UGA students' attainment of the general education curriculum learning outcomes, there are also reasons why UGA might wish to reconsider its use of this instrument. Given that we have used this particular instrument for a number of years, it may be an appropriate time to explore once again the assessment measures on the market to determine whether another instrument better matches our learning outcomes. CBASE, or perhaps a similar measure, could continue to be an assessment tool but perhaps in combination with other embedded measures. Such a mixed measures approach would allow for better triangulation of assessment data. Any new assessment plan will require the input and assistance of key stakeholders at UGA, such as the Office of the Vice President for Instruction, the Office of Academic Planning, the General Education Subcommittee of the University Curriculum Committee, and perhaps most significantly, UGA faculty teaching core courses.



Institutional 1:1 Summary Report

Institution: University of Georgia	Test Date: March 25, 2013	Number of Students: 529	Number taking English: 138
Location: Athens, GA	Test Form: LS		Number taking Mathematics: 131
FICE Number: 001598			Number taking Science: 129
			Number taking Social Studies: 131

Subject Scores

Subject Score & Standard Deviation

Cluster Score & Standard Deviation

English**	Reading & Literature	Reading Critically			Reading Analytically			Understanding Literature			Writing	Writing as a Process			Conventions of Written English		
		H	M	L	H	M	L	H	M	L		H	M	L	H	M	L
291 Median 55 S.D.	285 Median 58 S.D.	27	69	42	36	66	36	25	79	34	310 Median 46 S.D.	38	68	32	26	97	15
		20%	50%	30%	26%	48%	26%	18%	57%	25%		28%	49%	23%	19%	70%	11%

** English and Writing Scores were calculated without Writing Exercise

Mathematics	General Mathematics	Practical Applications			Properties & Notations			Using Statistics			Algebra	Evaluating Expressions			Equations & Inequalities			Geometry	2- & 3-Dimensional Figures			Geometrical Calculations		
		H	M	L	H	M	L	H	M	L		H	M	L	H	M	L		H	M	L	H	M	L
310 Median 66 S.D.	341 Median 54 S.D.	59	61	11	66	62	3	43	77	11	328 Median 64 S.D.	44	71	16	36	83	12	290 Median 78 S.D.	25	68	38	32	72	27
		45%	47%	8%	50%	47%	2%	33%	59%	8%		34%	54%	12%	27%	63%	9%		19%	52%	29%	24%	55%	21%

Skill Frequency Counts & Percentages

Science	Laboratory & Field Work	Observational/ Experimental Design			Laboratory/Field Techniques			Interpreting Results			Fundamental Concepts	Life Sciences			Physical Sciences		
		H	M	L	H	M	L	H	M	L		H	M	L	H	M	L
344 Median 54 S.D.	342 Median 48 S.D.	41	81	7	35	88	6	53	72	4	336 Median 53 S.D.	63	52	14	64	52	13
		32%	63%	5%	27%	68%	5%	41%	56%	3%		49%	40%	11%	50%	40%	10%

Social Studies	History	Significance of World Events			Significance of U.S. Events			Social Sciences	Geography			Political/Economic Structures			Social Science Procedures		
		H	M	L	H	M	L		H	M	L	H	M	L	H	M	L
327 Median 46 S.D.	313 Median 47 S.D.	27	99	5	31	90	10	329 Median 41 S.D.	43	83	5	49	74	8	53	72	6
		21%	76%	4%	24%	69%	8%		33%	63%	4%	37%	56%	6%	40%	55%	5%

Composite Score

319

Composite score represents the mean of the institutional subject scores.

Composite Score

Appendix 2: CBASE Institutional Comparison Report



Institutional Summary Report

Institution:	Comparative Report for University of Georgia	Test Date:	May 2010 to May 2013	Number of Complete Tests:	2,755
Location:	Athens, Georgia	Test Form:		Number of Incomplete Tests:	4,364
FICE Number:	001598				

Subject Scores

Subject	Category	Sub-Category	H	M	L	H	M	L	H	M	L	Median	S.D.	H	M	L	H	M	L	H	M	L	Median	S.D.
English	Reading & Literature	Reading Critically	787	2,939	1,842	14%	53%	33%							264 Median 57 S.D.									
		Reading Analytically	804	2,792	1,972	14%	50%	35%																
		Understanding Literature	708	2,527	2,333	13%	45%	42%																
	Writing	Writing as a Process	923	2,660	1,985	17%	48%	36%							274 Median 50 S.D.									
		Conventions of Written English	519	3,686	1,363	9%	66%	24%																
		Writing Exercise	43	4,396	1,144	1%	79%	20%																
	Mathematics	General Mathematics	Practical Applications	1,345	2,382	1,416	26%	46%	28%							288 Median 67 S.D.								
			Properties & Notations	1,402	2,762	979	27%	54%	19%															
			Using Statistics	1,192	2,493	1,458	23%	48%	28%															
		Algebra	Evaluating Expressions	1,218	2,851	1,074	24%	55%	21%							291 Median 67 S.D.								
Equations & Inequalities			1,183	3,018	942	23%	59%	18%																
Geometry			921	3,037	1,185	18%	59%	23%																
Science		Laboratory & Field Work	Observational/Experimental Design	836	2,073	828	22%	55%	22%							297 Median 61 S.D.								
			Laboratory/Field Techniques	630	2,322	785	17%	62%	21%															
			Interpreting Results	816	2,333	588	22%	62%	16%															
		Fundamental Concepts	Life Sciences	949	1,774	1,014	25%	47%	27%							292 Median 59 S.D.								
	Physical Sciences		802	1,983	952	21%	53%	25%																
	Social Studies		271 Median 62 S.D.																					
	Social Studies	History	Significance of World Events	463	2,657	1,067	11%	63%	25%							277 Median 57 S.D.								
			Significance of U.S. Events	625	2,516	1,046	15%	60%	25%															
			Social Sciences	626	2,342	1,219	15%	56%	29%															
		Geography	Political/Economic Structures	947	1,862	1,378	23%	44%	33%							276 Median 60 S.D.								
Social Science Procedures			1,025	2,346	816	24%	56%	19%																

Composite Score

278

Composite score represents the mean of the institutional subject scores.

Competency Scores

Competency	H	M	L	H	M	L	H	M	L
Interpretive Reasoning	1,107	1,493	155	40%	54%	6%			
Strategic Reasoning	415	1,780	560	15%	65%	20%			
Adaptive Reasoning	534	1,503	718	19%	55%	26%			