

## PERFORMANCE ON ADVANCED PLACEMENT EXAMINATIONS AND IN SUBSEQUENT POSTSECONDARY COURSEWORK

### Introduction

Section 1007.27(7), Florida Statutes, defines credit by examination as the program through which secondary and postsecondary students generate postsecondary credit based on the receipt of a specified minimum score on nationally standardized examinations. The examinations and the corresponding minimum scores required for an award of credit are delineated by the State Board of Education and the Board of Governors in the statewide articulation agreement required by s. 1007.23(1), Florida Statutes.

The Department has, since 2001, maintained the *ACC Credit-by-Exam Equivalencies*, which is a listing of examination programs and their associated college courses and credits. This list was initially created and is maintained with the assistance of faculty discipline committees. Initial award of credit is guaranteed for passing scores in Advanced Placement (AP), International Baccalaureate (IB), Advanced International Certificate of Education (AICE), and the College Level Examination Program (CLEP); transfer credit is guaranteed for these exams plus DSST and Excelsior.

In HB 7151, the 2011 Legislature mandated the use of student performance data in the determination of exam and course equivalencies.

1007.27 Articulated acceleration mechanisms.—

(2) The Department of Education shall annually identify and publish the minimum scores, maximum credit, and course or courses for which credit is to be awarded for each College Level Examination Program (CLEP) ~~general examination, CLEP subject examination, College Board Advanced Placement Program examination, Advanced International Certificate of Education examination, and International Baccalaureate examination.~~ The department shall use student performance data in subsequent postsecondary courses to determine the appropriate examination scores and courses for which credit is to be granted. Minimum scores may vary by subject area based on available performance data. In addition, the department shall identify such courses in the general education core curriculum of each state university and community college.

Prior to this legislation, institution anecdotal reports raised concerns regarding student preparation for subsequent coursework with AP exam scores of three. Therefore, the initial phase of this study focuses only on this exam mechanism. Advanced Placement is “the enrollment of an eligible secondary student in a course offered through the Advanced Placement Program administered by the College Board” (Section 1007.27(6), Florida Statutes). Students enrolled in AP courses are eligible to receive postsecondary credit only if they obtain a minimum score of three, on a five-point scale, on the corresponding Advanced Placement Examination.

This study analyzes completion of an Advanced Placement examination with an appropriate passing score and performance in subsequent coursework. This is compared to performance in the equivalent course that would be exempted by the Advanced Placement exam, and performance in that same subsequent course. Advanced Placement examination, equivalent course, and subsequent course information were taken from the *ACC Credit-by-Exam Equivalencies*.

### Summary

Students who complete Advanced Placement examinations with a score of three to five generally achieve at least passing scores in subsequent coursework. AP student grade point averages in subsequent coursework are generally higher than the grade point averages of students who complete the equivalent course in class, and then complete the subsequent course. These data indicate that no changes are needed to the Advanced Placement portion of the *ACC Credit-by-Exam Equivalencies* based solely on student performance in subsequent coursework.

**Method**

- (1) The source for the Advanced Placement and course taking data was the Education Data Warehouse in the Department of Education. This file composed of:
  - 1) Cohorts = 0607, 0708, 0809 FTIC SUS and CC students who graduated from a Florida high school
  - 2) All AP, IB and AICE exam scores for the cohorts (AP tests in the cohorts ranged from those taken between 1995 and 2009 (inclusive))
  - 3) Demographics for the cohorts
  - 4) High school (district and school) and postsecondary institutions enrolled
  - 5) All postsecondary courses and grades through the most current (including any DE courses taken during HS)
  - 6) HS graduation date and HS awards
  - 7) HS GPA
  - 8) Highest college admission subtest scores (all available sources)

*Not all data elements were used in the study*
- (2) Subsequent coursework was limited to those courses taken within two years (nine terms) of the Advanced Placement examination or the equivalent course. For AP exams this would include 79% of the subsequent coursework. The range of postsecondary coursework was from 8 years before the exam to 15 years after the exam.
- (3) High school grade point averages were grouped into categories:
  - 0-1.999
  - 2.000-2.499
  - 2.500-2.999
  - 3.000-3.499
  - 3.500-4.000
- (4) Grades were reported as letter grades. For the purposes of GPA calculations these letter grades were translated into numeric grades. Some grades do not affect the GPA, and were left out of the analysis.

Letter Grade	Grade Points	Letter Grade		Grade Points	Letter Grade		Grade Points	Letter Grade		Grade Points
A	4.00	AU	Audit	N/A	M	No Grade Awarded	N/A	WC	Withdrawn	N/A
A-	3.75	DR	Withdrawn	N/A	N	No Grade Awarded	N/A	WD	Withdrawn	N/A
B+	3.25	E	Fail/Unsatisfactory	0.00	N*	No Grade Awarded	N/A	WF	Fail/Unsatisfactory	0.00
B	3.00	EC	Exemption Credit	N/A	NC	Other	N/A	WI	Withdrawn	N/A
B-	2.75	ED	Other	N/A	NG	No Grade Awarded	0.00	WM	Withdrawn	N/A
C+	2.25	F0	Fail/Unsatisfactory	0.00	NR	No Grade Awarded	N/A	WP	Withdrawn	N/A
C	2.00	FA	Other	N/A	P	Pass	2.00	WR	Withdrawn	N/A
C-	1.75	I	Fail/Unsatisfactory	0.00	PR	Other	N/A	X	Audit	N/A
D+	1.25	I*	Incomplete	N/A	S	Satisfactory	2.00	XX	Audit	N/A
D	1.00	IB	International Baccalaureate	N/A	TR	Other	N/A	Y	Audit	N/A
D-	0.75	IF	Fail/Unsatisfactory	0.00	U	Fail/Unsatisfactory	0.00	YYY	Audit	N/A
F	0.00	IN	Incomplete	N/A	W	Withdrawn	N/A	Z	Continuing Registration	N/A
								ZR	Audit	N/A
								ZZ	Audit	N/A

- (5) Course repeats were not included in the analysis of performance on specific courses. In the case of course repeats for either the matched initial or subsequent course: for the initial course only the last attempt was included in the analysis, for the subsequent course only the first attempt was included in the analysis.

- (6) Each summary table displays advanced placement exam scores and/or course grade point averages. In many instances there were relatively few students who moved from the AP examination to the subsequent course. Therefore, in each case a test for ranked data (Mann-Whitney U) was performed for the differences in subsequent course grade point averages between the students with the appropriate passing score on the AP examination and those completing the equivalent course.
- (7) Detailed data tables break down exam scores and course grade point averages by high school student cumulative grade point averages and in which sector the subsequent course was completed.

### AP CALCULUS AB

Exam and course information from the *ACC Credit-by-Exam Equivalencies*

Exam	AP Exam Score of 3	AP Exam Score of 4	AP Exam Score of 5
Calculus AB	MAC X311 (min. 4 credits)	Same as 3	Same as 3

#### -----SUMMARY-----

**Comparison of student performance for those completing AP Calculus AB (incl. BC subscore) with a score of 3-5 or MAC x311 “Calculus I” with a grade of A/B/C and later performance in MAC x312 “Calculus II”**

AP Score 3		AP Score 4		AP Score 5		Total Count	Total MAC x312 GPA
MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA		
92	2.56 <sup>1</sup>	102	2.83	91	3.14	<b>285</b>	<b>2.84<sup>2</sup></b>

MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A		Total Count	Total MAC x312 GPA
MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA		
2034	1.80	2884	2.45	2840	3.21	<b>7758</b>	<b>2.56<sup>1 2</sup></b>

<sup>1</sup> $p > 0.05$   
<sup>2</sup> $p < 0.001$

**AP Calculus AB with scores of 3-5 and subsequent performance in MAC x312 “Calculus II,” taken as next mathematics course within two years (nine terms).**

Subsequent Course Taken in Florida College System								
AP Score	AP Score 3		AP Score 4		AP Score 5		Total Count	Total MAC x312 GPA
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA		
2.000-2.499	2	2.00					2	2.00
2.500-2.999	6	2.67	3	1.67	2	2.00	11	2.27
3.000-3.499	9	1.67	3	2.00	6	2.17	18	1.89
3.500-4.000	10	3.40	3	3.33	7	3.57	20	3.45
Grand Total	27	2.56	9	2.33	15	2.80	51	2.59
Subsequent Course Taken in the State University System								
AP Score	AP Score 3		AP Score 4		AP Score 5		Total Count	Total MAC x312 GPA
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA		
2.500-2.999	5	1.55	8	1.38	1	3.00	14	1.55
3.000-3.499	16	2.11	28	2.46	13	2.42	57	2.36
3.500-4.000	43	2.81	56	3.30	59	3.37	158	3.19
NA	1	4.00	1	2.25	3	3.42	5	3.30
Grand Total	65	2.56	93	2.87	76	3.21	234	2.89

Grand Total								
AP Score	AP Score 3		AP Score 4		AP Score 5			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
2.000-2.499	2	2.00					2	2.00
2.500-2.999	11	2.16	11	1.45	3	2.33	25	1.87
3.000-3.499	25	1.95	31	2.42	19	2.34	75	2.24
3.500-4.000	53	2.92	59	3.31	66	3.39	178	3.22
NA	1	4.00	1	2.25	3	3.42	5	3.30
Grand Total	92	2.56	102	2.83	91	3.14	285	2.84

**MAC x311 “Calculus I” with grade of A/B/C and subsequent performance in MAC x312 “Calculus II” taken within two years (nine terms)**

Subsequent Course Taken in Florida College System								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	7	1.86	21	2.86	23	3.55	51	3.03
2.000-2.499	44	1.55	51	1.82	49	3.14	144	2.19
2.500-2.999	177	1.70	199	2.37	165	2.96	541	2.33
3.000-3.499	315	1.87	376	2.34	341	2.92	1032	2.39
3.500-4.000	112	2.05	287	2.54	448	3.37	847	2.92
blank	2	3.00	3	3.00	7	3.29	12	3.17
Grand Total	657	1.84	937	2.39	1033	3.15	2627	2.55
Subsequent Course Taken in the State University System								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	9	1.58	15	2.18	26	3.25	50	2.63
2.000-2.499	18	1.61	8	1.72	9	3.22	35	2.05
2.500-2.999	200	1.29	181	1.96	67	2.91	448	1.80
3.000-3.499	608	1.67	676	2.28	434	2.88	1718	2.22
3.500-4.000	539	2.09	1061	2.70	1268	3.39	2868	2.89
blank	3	2.75	6	2.38	3	3.92	12	2.85
Grand Total	1377	1.78	1947	2.48	1807	3.25	5131	2.56
Grand Total								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	16	1.70	36	2.58	49	3.39	101	2.83
2.000-2.499	62	1.56	59	1.81	58	3.15	179	2.16
2.500-2.999	377	1.48	380	2.17	232	2.95	989	2.09
3.000-3.499	923	1.74	1052	2.30	775	2.90	2750	2.28
3.500-4.000	651	2.09	1348	2.67	1716	3.38	3715	2.90
blank	5	2.85	9	2.58	10	3.48	24	3.01
Grand Total	2034	1.80	2884	2.45	2840	3.21	7758	2.56

## AP CALCULUS BC

Exam and course information from the *ACC Credit-by-Exam Equivalencies*

Exam	AP Exam Score of 3	AP Exam Score of 4	AP Exam Score of 5	Comments
Calculus BC	MAC X311 (min. 4 credits)	MAC X311 and X312 (min. 8 credits)	Same as 4	The BC exam includes a subscore for the AB portion of the exam for Calculus AB credit. Colleges should regard the subscore on the BC exam the same as an AP Calculus AB Exam score.

-----SUMMARY-----

**Comparison of student performance for those completing AP Calculus BC with a score of 3 or MAC x311 “Calculus I” with a grade of A/B/C and later performance in MAC x312 “Calculus II”**

AP Score 3	
MAC x312 Count	MAC x312 GPA
33	<b>2.78<sup>1</sup></b>

MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
2034	1.80	2884	2.45	2840	3.21	7758	<b>2.56<sup>1</sup></b>

<sup>1</sup>*p* > 0.05

**Comparison of student performance for those completing AP Calculus BC with a score of 4-5 or MAC x312 “Calculus II” with a grade of A/B/C and later performance in MAC x313 “Calculus III”**

AP Score 4		AP Score 5			
MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total Count	Total MAC x313 GPA
16	3.69	37	2.98	53	<b>3.17<sup>1</sup></b>

MAC x312 Grade C		MAC x312 Grade B		MAC x312 Grade A			
MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total MAC x313 Count	Total MAC x313 GPA
1502	2.07	2019	2.67	2049	3.33	5570	<b>2.75<sup>1</sup></b>

<sup>1</sup>*p* < 0.001

**AP Calculus BC with score of 3 and subsequent performance in MAC x312 “Calculus II” as next mathematics course within two years**

Subsequent Course Taken in Florida College System		
HS GPA	MAC x312 Count	MAC x312 GPA
2.000-2.499	1	0.00
2.500-2.999	1	
3.000-3.499	6	2.33
3.500-4.000	2	4.00
Grand Total	10	2.44
Subsequent Course Taken in the State University System		
HS GPA	MAC x312 Count	MAC x312 GPA
2.500-2.999	1	2.75

3.000-3.499	9	1.89
3.500-4.000	13	3.54
Grand Total	23	2.93
Grand Total		
HS GPA	MAC x312 Count	MAC x312 GPA
2.000-2.499	1	0.00
2.500-2.999	2	2.75
3.000-3.499	15	2.10
3.500-4.000	15	3.61
Grand Total	33	2.78

**MAC x311 “Calculus I” with grade of A/B/C and subsequent performance in MAC x312 “Calculus II” as next mathematics course taken within two years (nine terms).**

Subsequent Course Taken in Florida College System								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	7	1.86	21	2.86	23	3.55	51	3.03
2.000-2.499	44	1.55	51	1.82	49	3.14	144	2.19
2.500-2.999	177	1.70	199	2.37	165	2.96	541	2.33
3.000-3.499	315	1.87	376	2.34	341	2.92	1032	2.39
3.500-4.000	112	2.05	287	2.54	448	3.37	847	2.92
blank	2	3.00	3	3.00	7	3.29	12	3.17
Grand Total	657	1.84	937	2.39	1033	3.15	2627	2.55
Subsequent Course Taken in the State University System								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	9	1.58	15	2.18	26	3.25	50	2.63
2.000-2.499	18	1.61	8	1.72	9	3.22	35	2.05
2.500-2.999	200	1.29	181	1.96	67	2.91	448	1.80
3.000-3.499	608	1.67	676	2.28	434	2.88	1718	2.22
3.500-4.000	539	2.09	1061	2.70	1268	3.39	2868	2.89
blank	3	2.75	6	2.38	3	3.92	12	2.85
Grand Total	1377	1.78	1947	2.48	1807	3.25	5131	2.56
Grand Total								
	MAC x311 Grade C		MAC x311 Grade B		MAC x311 Grade A			
HS GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	MAC x312 Count	MAC x312 GPA	Total Count	Total MAC x312 GPA
0-1.999	16	1.70	36	2.58	49	3.39	101	2.83
2.000-2.499	62	1.56	59	1.81	58	3.15	179	2.16
2.500-2.999	377	1.48	380	2.17	232	2.95	989	2.09
3.000-3.499	923	1.74	1052	2.30	775	2.90	2750	2.28
3.500-4.000	651	2.09	1348	2.67	1716	3.38	3715	2.90
blank	5	2.85	9	2.58	10	3.48	24	3.01
Grand Total	2034	1.80	2884	2.45	2840	3.21	7758	2.56

**AP Calculus BC with score of 4-5 and subsequent performance in MAC x313 “Calculus II” as next mathematics course within two years**

Subsequent Course Taken in Florida College System						
	AP Score 4		AP Score 5			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total Count	Total MAC x313 GPA
2.500-2.999			3	1.67	3	1.67
3.000-3.499	2	3.50			2	3.50
Grand Total	2	3.50	3	1.67	5	2.40
Subsequent Course Taken in the State University System						
	AP Score 4		AP Score 5			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total Count	Total MAC x313 GPA
2.500-2.999			2	0.50	2	0.50
3.000-3.499	4	3.00	5	2.00	9	2.17
3.500-4.000	9	3.81	26	3.47	35	3.56
NA	1	3.75	1	4.00	2	3.88
Grand Total	14	3.73	34	3.10	48	3.25
Grand Total						
	AP Score 4		AP Score 5			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total Count	Total MAC x313 GPA
2.500-2.999			5	1.20	5	1.20
3.000-3.499	6	3.33	5	2.00	11	2.50
3.500-4.000	9	3.81	26	3.47	35	3.56
NA	1	3.75	1	4.00	2	3.88
Grand Total	16	3.69	37	2.98	53	3.17

**MAC x312 with grade of A/B/C and performance in MAC x313 “Calculus II” as next mathematics course within two years (nine terms)**

Subsequent Course Taken in Florida College System								
	MAC x312 Grade C		MAC x312 Grade B		MAC x312 Grade A			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total MAC x313 Count	Total MAC x313 GPA
0-1.999	7	2.71	6	2.17	15	3.73	28	3.14
2.000-2.499	20	2.20	21	2.52	16	3.38	57	2.65
2.500-2.999	82	2.23	87	2.84	63	3.49	232	2.80
3.000-3.499	159	2.35	175	2.74	129	3.34	463	2.78
3.500-4.000	81	2.78	153	3.07	199	3.76	433	3.33
blank	1	3.00	1	3.00	4	3.25	6	3.17
Grand Total	350	2.42	443	2.86	426	3.57	1219	2.98
Subsequent Course Taken in the State University System								
	MAC x312 Grade C		MAC x312 Grade B		MAC x312 Grade A			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total MAC x313 Count	Total MAC x313 GPA
0-1.999	8	2.38	11	3.16	31	3.29	50	3.12
2.000-2.499	21	1.85	8	1.66	6	3.67	35	2.11
2.500-2.999	110	1.74	95	2.24	64	2.81	269	2.17
3.000-3.499	482	1.83	510	2.47	291	2.89	1283	2.32
3.500-4.000	526	2.15	950	2.73	1222	3.37	2698	2.91
blank	5	1.65	2	3.13	9	3.50	16	2.88
Grand Total	1152	1.97	1576	2.61	1623	3.26	4351	2.69
Grand Total								
	MAC x312 Grade C		MAC x312 Grade B		MAC x312 Grade A			
HS GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	MAC x313 Count	MAC x313 GPA	Total MAC x313 Count	Total MAC

					Count			x313 GPA
0-1.999	15	2.53	17	2.81	46	3.43	78	3.13
2.000-2.499	41	2.02	29	2.28	22	3.45	92	2.45
2.500-2.999	192	1.95	182	2.53	127	3.15	501	2.46
3.000-3.499	641	1.96	685	2.54	420	3.03	1746	2.44
3.500-4.000	607	2.23	1103	2.78	1421	3.43	3131	2.97
blank	6	1.88	3	3.08	13	3.42	22	2.95
Grand Total	1502	2.07	2019	2.67	2049	3.33	5570	2.75

## AP BIOLOGY

Exam and course information from the *ACC Credit-by-Exam Equivalencies*

Exam	AP Exam Score of 3	AP Exam Score of 4	AP Exam Score of 5
Biology	BSC X005C or BSC X005/X005L (min. 4 credits)	BSC X010C or BSC X010/X010L (min. 4 credits)	BSC X010C or BSC X010/X010L and BSC X011C or BSC X011/X011L (min. 8 credits)

### -----SUMMARY-----

**Comparison of student performance for those completing AP Biology with a score of 3 or BSC x005 “General Biology” with a grade of A/B/C and subsequent performance in BSC x010 “Biology I”**

AP Score 3	
BSC x010 Count	BSC x010 GPA
110	<b>2.99<sup>1</sup></b>

BSC x005 Grade C		BSC x005 Grade B		BSC x005 Grade A		Total Count	Total BSC x010 GPA
BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA		
382	1.87	742	2.38	920	3.05	2044	<b>2.59<sup>1</sup></b>

<sup>1</sup>*p* < 0.001

**Comparison of student performance for those completing AP Biology with a score of 4 or BSC x010 “Biology I” with a grade of A/B/C and later performance in BSC x011 “Biology II”**

AP Score 4	
BSC x011 Count	BSC x011 GPA
29	<b>2.90<sup>1</sup></b>

BSC x010 Grade C		BSC x010 Grade B		BSC x010 Grade A		Total Count	Total BSC x010 GPA
BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA		
5661	2.29	8042	2.81	6424	3.39	20127	<b>2.85<sup>1</sup></b>

<sup>1</sup>*p* < 0.01



**AP Biology with score of 3 and subsequent performance in BSC x010 “Biology I” as next BSC course taken within two years (nine terms)**

Subsequent Course Taken in Florida College System		
HS GPA	BSC x010 Count	BSC x010 GPA
2.500-2.999	2	2.00
3.000-3.499	5	3.00
3.500-4.000	7	3.00
Grand Total	14	2.86
Subsequent Course Taken in the State University System		
HS GPA	BSC x010 Count	BSC x010 GPA
2.500-2.999	6	2.81
3.000-3.499	39	2.48
3.500-4.000	50	3.43
NA	1	
Grand Total	96	3.02
Grand Total		
Row Labels	BSC x010 Count	BSC x010 GPA
2.500-2.999	8	2.54
3.000-3.499	44	2.55
3.500-4.000	57	3.37
NA	1	
Grand Total	110	2.99

**BSC x005 “General Biology” with grade of A/B/C and subsequent performance in BSC x010 “Biology I” as next BSC course taken within two years**

Subsequent Course Taken in Florida College System								
Row Labels	BSC x005 Grade C		BSC x005 Grade B		BSC x005 Grade A		Total Count	Total BSC x010 GPA
	BSC x010 Count	GPA	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA		
0-1.999	9	1.03	7	1.86	8	3.13	24	1.97
2.000-2.499	46	1.54	64	1.77	36	2.94	146	1.99
2.500-2.999	111	1.86	153	2.25	132	2.92	396	2.36
3.000-3.499	108	1.99	234	2.52	218	2.88	560	2.56
3.500-4.000	18	2.35	107	2.80	220	3.26	345	3.07
Grand Total	292	1.86	565	2.40	614	3.03	1471	2.56
Subsequent Course Taken in the State University System								
Row Labels	BSC x005 Grade C		BSC x005 Grade B		BSC x005 Grade A		Total Count	Total BSC x010 GPA
	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA		
0-1.999	1	0.00	3	1.00	2	2.88	6	1.46
2.000-2.499	7	1.43	5	2.40	2	4.00	14	2.14
2.500-2.999	41	1.91	46	2.04	45	2.90	132	2.29
3.000-3.499	40	1.96	94	2.33	136	2.97	270	2.60
3.500-4.000	1	3.00	29	2.85	120	3.29	150	3.21
(blank)					1	3.00	1	3.00
Grand Total	90	1.88	177	2.32	306	3.09	573	2.66
Grand Total								
Row Labels	BSC x005 Grade C		BSC x005 Grade B		BSC x005 Grade A		Total Count	Total BSC x010 GPA
	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA	BSC x010 Count	BSC x010 GPA		
0-1.999	10	0.93	10	1.60	10	3.08	30	1.87
2.000-2.499	53	1.53	69	1.81	38	3.00	160	2.00
2.500-2.999	152	1.88	199	2.20	177	2.91	528	2.35

3.000-3.499	148	1.98	328	2.46	354	2.92	830	2.57
3.500-4.000	19	2.38	136	2.81	340	3.27	495	3.11
(blank)					1	3.00	1	3.00
Grand Total	382	1.87	742	2.38	920	3.05	2044	2.59

**AP Biology with score of 4 and subsequent performance in BSC x011 “Biology II” as next BSC course taken within two years (nine terms)**

Subsequent Course Taken in Florida College System		
HS GPA	BSC x011 Count	BSC x011 GPA
3.000-3.499	1	1.00
Grand Total	1	1.00
Subsequent Course Taken in the State University System		
Row Labels	BSC x011 Count	BSC x011 GPA
2.500-2.999	1	2.25
3.000-3.499	6	3.38
3.500-4.000	20	2.92
NA	1	2.25
Grand Total	28	2.97
Grand Total		
Row Labels	BSC x011 Count	BSC x011 GPA
2.500-2.999	1	2.25
3.000-3.499	7	3.04
3.500-4.000	20	2.92
NA	1	2.25
Grand Total	29	2.90

**BSC x010 “Biology I” and subsequent performance in BSC x011 as next BSC course taken within two years (nine terms)**

Subsequent Course Taken in Florida College System								
HS GPA	BSC x010 Grade C		BSC x010 Grade B		BSC x010 Grade A		Total Count	Total BSC x011 GPA
	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA		
0-1.999	25	2.56	27	2.30	36	3.03	88	2.67
2.000-2.499	125	1.91	170	2.50	103	3.15	398	2.48
2.500-2.999	501	1.96	571	2.56	392	3.18	1464	2.52
3.000-3.499	676	2.14	993	2.65	782	3.24	2451	2.70
3.500-4.000	193	2.40	574	3.02	914	3.53	1681	3.23
(blank)	4	3.00	12	3.25	9	3.25	25	3.21
Grand Total	1524	2.11	2347	2.71	2236	3.34	6107	2.79
Subsequent Course Taken in the State University System								
HS GPA	BSC x010 Grade C		BSC x010 Grade B		BSC x010 Grade A		Total Count	Total BSC x011 GPA
	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA		
0-1.999	39	2.36	38	3.05	55	3.54	132	3.05
2.000-2.499	56	1.60	47	2.19	19	2.42	122	1.95
2.500-2.999	516	1.82	498	2.32	190	2.87	1204	2.19
3.000-3.499	1681	2.25	2026	2.70	1087	3.12	4794	2.64
3.500-4.000	1836	2.64	3065	3.06	2822	3.58	7723	3.15
(blank)	9	2.75	21	2.61	15	3.82	45	3.04
Grand Total	4137	2.36	5695	2.86	4188	3.42	14020	2.88

Grand Total								
	BSC x010 Grade C		BSC x010 Grade B		BSC x010 Grade A			
HS GPA	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA	BSC x011 Count	BSC x011 GPA	Total Count	Total BSC x011 GPA
0-1.999	64	2.44	65	2.73	91	3.34	220	2.90
2.000-2.499	181	1.81	217	2.43	122	3.04	520	2.36
2.500-2.999	1017	1.89	1069	2.45	582	3.08	2668	2.37
3.000-3.499	2357	2.22	3019	2.68	1869	3.17	7245	2.66
3.500-4.000	2029	2.61	3639	3.05	3736	3.57	9404	3.16
(blank)	13	2.83	33	2.84	24	3.60	70	3.10
Grand Total	5661	2.29	8042	2.81	6424	3.39	20127	2.85

### AP CHEMISTRY

Exam and course information from the ACC Credit-by-Exam Equivalencies

Exam	AP Exam Score of 3	AP Exam Score of 4	AP Exam Score of 5
Chemistry	CHM X020C or CHM X020 /X020L (min. 4 credits)	CHM X045C or CHM X045/X045L or CHM X040/X045L (min. 4 credits)	CHM X045C or CHM X045/X045L and CHM X046 or X046/X046L (min. 8 credits)

#### -----SUMMARY-----

**Comparison of student performance for those completing AP Chemistry with a score of 3 or CHM x020 "Introduction to Chemistry" with a grade of A/B/C and subsequent performance in CHM x045 "General Chemistry I"**

AP Score 3	
CHM x045 Count	CHM x045 GPA
90	3.40 <sup>1</sup>

CHM x020 Grade C		CHM x020 Grade B		CHM x020 Grade A		Total CHM x045 Count	Total CHM x045 GPA
CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA		
375	1.42	245	1.99	184	2.84	804	1.93 <sup>1</sup>

<sup>1</sup>p < 0.001

**Comparison of student performance for those completing AP Chemistry with a score of 4 or CHM x045 "General Chemistry I" with a grade of A/B/C and subsequent performance in CHM x046 "General Chemistry II"**

AP Score 4	
CHM x046 Count	CHM x046 GPA
41	3.36 <sup>1</sup>

CHM x045 Grade C		CHM x045 Grade B		CHM x045 Grade A		Total CHM x046 Count	Total CHM x046 GPA
CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA		
2513	2.36	5367	3.00	8212	3.62	16092	3.22 <sup>1</sup>

<sup>1</sup>p > 0.05

**AP Chemistry with a score of 3 and subsequent performance in CHM x045 “General Chemistry I” as next CHM course taken within two years**

Subsequent Course Taken in Florida College System		
Row Labels	CHM x045 Count	CHM x045 GPA
2.000-2.499	1	0.00
2.500-2.999	4	4.00
3.000-3.499	3	3.00
3.500-4.000	3	3.67
NA	2	4.00
Grand Total	13	3.42
Subsequent Course Taken in the State University System		
Row Labels	CHM x045 Count	CHM x045 GPA
2.500-2.999	7	3.04
3.000-3.499	14	3.30
3.500-4.000	54	3.46
NA	2	3.63
Grand Total	77	3.40
Grand Total		
Row Labels	CHM x045 Count	CHM x045 GPA
2.000-2.499	1	0.00
2.500-2.999	11	3.39
3.000-3.499	17	3.27
3.500-4.000	57	3.47
NA	4	3.81
Grand Total	90	3.40

**CHM x020 “Fundamentals of Chemistry” with grade of A/B/C and subsequent performance in CHM 045 “General Chemistry I” as next CHM course within two years**

Subsequent Course Taken in Florida College System								
HS GPA	CHMx020 Grade C		CHMx020 Grade B		CHMx020 Grade A		Total CHM x045 Count	Total CHM x045 GPA
	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA		
0-1.999	1	2.00			1	3.00	2	2.50
2.000-2.499	9	0.33	12	1.83	7	3.33	28	1.83
2.500-2.999	20	1.79	31	1.63	10	3.00	61	1.92
3.000-3.499	24	2.05	32	2.14	41	3.24	97	2.64
3.500-4.000	2	2.00	14	2.73	22	3.52	38	3.18
(blank)			1	4.00	1	3.00	2	3.50
Grand Total	56	1.83	90	2.03	82	3.29	228	2.49
Subsequent Course Taken in the State University System								
HS GPA	CHMx020 Grade C		CHMx020 Grade B		CHMx020 Grade A		Total CHM x045 Count	Total CHM x045 GPA
	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA		
0-1.999	2	2.50			1	0.00	3	1.67
2.000-2.499	25	1.19	3	2.33	4	2.00	32	1.44
2.500-2.999	121	1.25	49	1.70	15	1.70	185	1.41
3.000-3.499	146	1.48	74	2.02	45	2.53	265	1.81
3.500-4.000	25	1.28	29	2.30	37	2.87	91	2.25

Grand Total	319	1.36	155	1.97	102	2.46	576	1.72
Grand Total								
	CHMx020 Grade C		CHMx020 Grade B		CHMx020 Grade A			
HS GPA	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA	CHM x045 Count	CHM x045 GPA	Total CHM x045 Count	Total CHM x045 GPA
0-1.999	3	2.33			2	1.50	5	2.00
2.000-2.499	34	1.08	15	2.00	11	2.57	60	1.56
2.500-2.999	141	1.31	80	1.67	25	2.21	246	1.53
3.000-3.499	170	1.56	106	2.05	86	2.88	362	2.03
3.500-4.000	27	1.34	43	2.43	59	3.15	129	2.54
(blank)			1	4.00	1	3.00	2	3.50
Grand Total	375	1.42	245	1.99	184	2.84	804	1.93

**AP Chemistry score of 4 and subsequent performance in CHM x046 “General Chemistry II” as next CHM course within two years**

Subsequent Course Taken in Florida College System		
HS GPA	CHM x046 Count	CHM x046 GPA
2.500-2.999	2	2.50
3.000-3.499	2	4.00
3.500-4.000	1	4.00
Grand Total	5	3.40
Subsequent Course Taken in the State University System		
HS GPA	CHM x046 Count	CHM x046 GPA
3.000-3.499	11	2.81
3.500-4.000	22	3.49
NA	3	4.00
Grand Total	36	3.36
Grand Total		
HS GPA	CHM x046 Count	CHM x046 GPA
2.500-2.999	2	2.50
3.000-3.499	13	3.05
3.500-4.000	23	3.51
NA	3	4.00
Grand Total	41	3.36

**CHM x045 “General Chemistry I” with grade of A/B/C and subsequent performance in CHM x046 “General Chemistry II” as next CHM course within two years**

Subsequent Course Taken in Florida College System								
	CHM X045 Grade C		CHM X045 Grade B		CHM X045 Grade A			
HS GPA	CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA	Total CHM x046 Count	Total CHM x046 GPA
0-1.999	7	3.33	13	3.00	10	3.50	30	3.25
2.000-2.499	45	2.21	62	2.82	48	3.35	155	2.82
2.500-2.999	172	2.40	256	2.87	219	3.36	647	2.92
3.000-3.499	271	2.24	500	2.86	508	3.41	1279	2.95
3.500-4.000	115	2.61	343	3.10	595	3.62	1053	3.34
(blank)	2	3.00	4	3.00	9	3.44	15	3.27
Grand Total	612	2.37	1178	2.94	1389	3.49	3179	3.08
Subsequent Course Taken in the State University System								
	CHM X045 Grade C		CHM X045 Grade B		CHM X045 Grade A			
HS GPA	CHM x046	CHM x046	CHM x046	CHM x046	CHM x046	CHM x046	Total CHM	Total CHM

	Count	GPA	Count	GPA	Count	GPA	x046 Count	x046 GPA
0-1.999	16	2.38	27	2.92	82	3.75	125	3.40
2.000-2.499	30	1.88	39	2.38	19	2.72	88	2.28
2.500-2.999	237	2.06	362	2.57	252	3.32	851	2.66
3.000-3.499	846	2.24	1577	2.89	1630	3.47	4053	3.00
3.500-4.000	769	2.59	2172	3.19	4815	3.72	7756	3.47
(blank)	3	3.67	12	3.11	25	3.61	40	3.49
Grand Total	1901	2.35	4189	3.02	6823	3.64	12913	3.26
Grand Total								
	CHM X045 Grade C		CHM X045 Grade B		CHM X045 Grade A			
HS GPA	CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA	CHM x046 Count	CHM x046 GPA	Total CHM x046 Count	Total CHM x046 GPA
0-1.999	23	2.64	40	2.95	92	3.72	155	3.37
2.000-2.499	75	2.06	101	2.65	67	3.17	243	2.62
2.500-2.999	409	2.20	618	2.70	471	3.34	1498	2.77
3.000-3.499	1117	2.24	2077	2.88	2138	3.45	5332	2.99
3.500-4.000	884	2.59	2515	3.18	5410	3.71	8809	3.45
(blank)	5	3.40	16	3.08	34	3.57	55	3.43
Grand Total	2513	2.36	5367	3.00	8212	3.62	16092	3.22

### AP ENGLISH LANGUAGE AND COMPOSITION

Exam and course information from the *ACC Credit-by-Exam Equivalencies*

Exam	AP Exam Score of 3	AP Exam Score of 4	AP Exam Score of 5	Comments
English Language and Composition	ENC X101 (min. 3 credits)	ENC X101 and X102 (min. 6 credits)	Same as 4	Award min. 3 credits if ENC X101 already satisfied.

#### -----SUMMARY-----

**Comparison of student performance for those who complete AP English Language and Composition with a score of 3 or ENC x101 “Freshman Composition I” with a grade of A/B/C and subsequent performance in ENC x102 “Freshman Composition II”**

AP Score 3	
ENC x102 Count	ENC x102 GPA
230	2.83 <sup>1</sup>

ENC x101 Grade C		ENC x101 Grade B		ENC x101 Grade A		Total Count	Total ENC x102 GPA
ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA		
32602	2.20	59346	2.75	40891	3.26	132839	2.78 <sup>1</sup>

<sup>1</sup> $p < 0.05$

**AP English with score of 3 and subsequent performance in ENC x102 “Freshman Composition II” as next ENC course taken with two years**

Subsequent Course Taken in Florida College System		
HS GPA	ENC x102 Count	ENC x102 GPA
0.000-1.999	6	0.50
2.000-2.499	6	1.83
2.500-2.999	22	2.18
3.000-3.499	45	3.04
3.500-4.000	24	3.50
Grand Total	103	2.75
Subsequent Course Taken in the State University System		
HS GPA	ENC x102 Count	ENC x102 GPA
2.000-2.499	2	3.00
2.500-2.999	20	2.40
3.000-3.499	61	2.58
3.500-4.000	43	3.59
NA	1	2.00
Grand Total	127	2.89
Grand Total		
HS GPA	ENC x102 Count	ENC x102 GPA
0.000-1.999	6	0.50
2.000-2.499	8	2.13
2.500-2.999	42	2.29
3.000-3.499	106	2.78
3.500-4.000	67	3.56
NA	1	2.00
Grand Total	230	2.83

**ENC x101 “Freshman Composition I” with grade of A/B/C and subsequent performance in ENC x102 “Freshman Composition II” as next ENC course taken within two years**

Subsequent Course Taken in Florida College System								
	ENC x101 Grade C		ENC x101 Grade B		ENC x101 Grade A			
	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	Total Count	Total ENC x102 GPA
0-1.999	838	1.88	1052	2.28	661	2.97	2551	2.35
2.000-2.499	6961	1.85	6973	2.29	2881	2.76	16815	2.20
2.500-2.999	10769	2.14	14412	2.53	6923	2.94	32104	2.49
3.000-3.499	6501	2.42	14575	2.81	9180	3.21	30256	2.85
3.500-4.000	827	2.72	4215	3.16	6524	3.59	11566	3.38
(blank)	51	2.29	91	2.59	111	3.59	253	2.99
Grand Total	25947	2.15	41318	2.65	26280	3.19	93545	2.68
Subsequent Course Taken in the State University System								
	ENC x101 Grade C		ENC x101 Grade B		ENC x101 Grade A			
	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	Total Count	Total ENC x102 GPA
0-1.999	45	2.72	86	2.86	84	3.44	215	3.07
2.000-2.499	518	1.78	512	2.26	155	2.66	1185	2.11
2.500-2.999	2453	2.19	4099	2.61	1928	2.99	8480	2.58
3.000-3.499	3039	2.52	9401	2.99	6778	3.34	19218	3.05
3.500-4.000	595	2.80	3902	3.25	5636	3.62	10133	3.43
(blank)	5	2.75	28	2.99	30	3.59	63	3.24
Grand Total	6655	2.37	18028	2.95	14611	3.39	39294	3.03

Grand Total								
	ENC x101 Grade C		ENC x101 Grade B		ENC x101 Grade A			
	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	ENC x102 Count	ENC x102 GPA	Total Count	Total ENC x102 GPA
0-1.999	883	1.93	1138	2.33	745	3.03	2766	2.41
2.000-2.499	7479	1.84	7485	2.29	3036	2.75	18000	2.19
2.500-2.999	13222	2.15	18511	2.55	8851	2.95	40584	2.51
3.000-3.499	9540	2.45	23976	2.88	15958	3.26	49474	2.93
3.500-4.000	1422	2.75	8117	3.20	12160	3.60	21699	3.40
(blank)	56	2.34	119	2.70	141	3.59	316	3.04
Grand Total	32602	2.20	59346	2.75	40891	3.26	132839	2.78

---

Report completed by:

**Matthew Bouck**  
 Director, Office of Articulation  
 Florida Department of Education  
[matthew.bouck@fldoe.org](mailto:matthew.bouck@fldoe.org)  
 May, 2012