



FULLERTON COLLEGE ELEVATING. EXCELLENCE.

Two-Year Program Review Template Academic Programs

Basic Skills Mathematics Mathematics and Computer Science Division 2011 Program Review

Statement of Collaboration

The program faculty listed below collaborated in an open and forthright dialogue to prepare this Program Review. Statements included herein accurately reflect the conclusions and opinions of the program faculty.

Participants in the review:

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Authorization

After the document is complete, it must be signed by the Department Coordinator and Dean prior to submission to the Program Review Committee.

Signature of Department Coordinator

**Josh Danufsky,
Chair, Division Basic Skills Committee**

Signature of Dean

**Mark Greenhalgh,
Dean, Mathematics and Computer Science Division**

Date of Submission: **January 27, 2012**

1.0 Mission and Goals

Briefly describe the relationship of your program to the college's Mission, Vision, Core Values, and College Goals.

The Fullerton College Basic Skills mathematics program is built to support the college's mission to prepare students to be lifelong learners. Recognizing that mathematical thinking underpins almost every other course of study in our highly technological age, the basic skills sequence allows its students to develop the basics of numeric, geometric, and algebraic reasoning and to transition to college-level mathematics studies.

The instructors of the Basic Skills sequence are committed to encourage the inquiry and intellectual curiosity that math studies promote. We are proud to pass on the traditions of mathematical thought, which are often thousands of years old, while at the same time we embrace new technologies, both as pedagogical aids and as demonstrations of the application of mathematical thought. We are excited to support the diversity of the Fullerton College campus as it prepares to enter its second century of continuous operation.

Looking forward, the Basic Skills program is examining many initiatives to increase student engagement and success in our courses. We are examining the placement process and the possibility of transitioning to a model of student informed self-placement to increase student satisfaction with the Basic Skills sequence. We are re-examining the role of our Math Lab, exploring a reorganization of the way in which this important resource will serve Basic Skills students. We are moving forward on streamlining the Basic Skills sequence, so that a first-time Fullerton College student starting at the beginning of the sequence will transition to college level studies in fewer than the four semesters that are currently required. We are continuing our commitment to the college's Transfer Achievement Program (TAP), a campus-wide program that offers a great support to Basic Skills students. And we are exploring a new course offering that would satisfy the college's transfer requirement, but would emphasize a preparation for statistics study, rather than the preparation for calculus study which dominates the Intermediate Algebra course. The new course would be more appropriate for students in non-STEM (Science, Technology, Engineering, and Mathematics) majors.

2.0 Program Data and Trends Analysis

NOTE: Basic Skills data in this report does not include MATH 40. While the division considers MATH 40, Intermediate Algebra, a basic skills class (in the sense that it does not transfer), it is not coded as basic skills in the data reported to the state, and the data reported here.

2.1 Key Performance Indicators (KPI)

For each KPI listed below, summarize the trend. (5-year longitudinal data included in Appendix.)

KPI	Enrollment	Total FTES	Sections	FTEF	Fill Rate	WSCH/FTEF	Retention	Success
Trend	Decreased 3%	Increased 21%	Decreased 13%	Decreased 11%	Increased 16%	Increased 36%	Decreased 1%	Increased 1%

The five year trend in KPIs is shown in the table below:

Year	Enroll	Change (%)	FTES	Change (%)	Sec	Change (%)	FTEF	Change (%)	Fill Rates (%)	Change (%)	WSCH per FTEF	Change (%)	Ret (%)	Change (%)	Suc (%)	Change (%)
2006-2007	6127		980		157		49.8		89		591		72		49	
2007-2008	6342	3.5	1033	5.4	160	1.9	49.8	0.1	91	2	623	5.4	72	0	48	-1
2008-2009	6850	8.0	1087	5.2	162	1.3	50.4	0.1	100	9	647	3.7	71	-1	48	0
2009-2010	6819	-0.5	958	-11.9	165	1.9	45.5	-1.0	101	1	632	-2.3	74	3	50	2
2010-2011	5944	-12.8	1187	23.9	137	-17.0	44.3	-2.6	105	4	804	29.0	71	-3	50	0

2.2 Ranking of Department

How does your program compare with peers?

	Fullerton (n = 2,749)	LA City (n = 3,135)	LA Valley (n = 3,887)	San Diego City (n = 2,440)	Southwestern (n = 2,902)
Retention	67.52%	82.46%	81.83%	78.61%	78.12%
Success	45.11%	49.38%	48.72%	40.82%	48.79%

2.3 Achievement Gap

Indicate achievement gap for each of the groups listed below. *(Success and Retention by Ethnicity Data as identified by the Office of Institutional Research.)*

Group	Retention	Success
Males	66.15 %	43.50 %
Females	68.65 %	46.65 %
Asian-American	78.81 %	61.02 %
African-American	53.60 %	29.60 %
Filipino	67.39 %	50.00 %
Hispanic	66.87 %	41.94 %
Native American	57.14 %	35.71 %
Other Non-White	67.21 %	52.46 %
Pacific Islander	55.56 %	33.33 %
White	69.29 %	49.24 %
Unknown	69.15 %	51.24 %
Range (Max-Min)	25.21	31.42

2.4 Other Data

Please include any other data (internal or external) that may be relevant to student achievement, learning, and trends within your Basic Skills, CTE, or Transfer Education program.

I: RELATIVE SUCCESS

The Division examined a measure of Relative Success as part of its program review. Relative Success is defined as the percentage of retained students who receive a grade of A, B, C or CR.

I.e. Relative Success is computed as $\frac{\text{success}}{\text{retention}}(100)$

	Fullerton	LA City	LA Valley	San Diego City	Southwestern
Retention	67.52 %	82.46 %	81.83 %	78.61 %	78.12 %
Success	45.11 %	49.38 %	48.72 %	40.82 %	48.79 %
Relative Success	66.81 %	59.88 %	59.54 %	51.93 %	62.46 %

In analyzing this data by gender, the following table was generated:

	Retention	Success	Relative Success
Males	66.15 %	43.50 %	65.76 %
Females	68.65 %	46.65 %	67.95 %

In analyzing this data by ethnicity, the following table was generated:

	Retention	Success	Relative Success
Asian-American	78.81 %	61.02 %	77.43 %
African-American	53.60 %	29.60 %	55.22 %
Filipino	67.39 %	50.00 %	74.19 %
Hispanic	66.87 %	41.94 %	62.72 %
Native American	57.14 %	35.17 %	61.55 %
Other Non-White	67.21 %	52.46 %	78.05 %
Pacific Islander	55.56 %	33.33 %	59.99 %
White	69.29 %	49.24 %	71.06 %
Unknown	69.15 %	51.24 %	74.10 %
Range	25.21	31.42	22.83

In focusing on the traditional definition of the “achievement gap”:

	Retention	Success	Relative Success
White vs. Hispanic	$69.29 - 66.87 = 2.24\%$	$49.24 - 41.94 = 7.3\%$	$71.06 - 62.72 = 8.34\%$
White vs. African-American	$69.29 - 53.6 = 15.69\%$	$49.24 - 29.6 = 19.64\%$	$71.06 - 55.22 = 15.84\%$

II: PLACEMENT

The Division examined the Math Placement Recommendation by Race/Ethnicity for the previous three Fall registration cycles (Fall 2009, 2010, 2011).

Race/Ethnicity	Placements	MATH 10	MATH 15	MATH 20	MATH 40	MATH 100 or above
African American	975	7%	55%	19%	6%	11%
Asian	1,821	1%	18%	13%	10%	58%
Filipino	561	2%	31%	20%	9%	37%
Hispanic	8,939	4%	51%	20%	8%	17%
Native American	102	4%	53%	16%	12%	16%
Other	1,454	3%	37%	16%	10%	35%
Unknown	646	3%	43%	19%	9%	27%
White	5,102	2%	42%	21%	11%	24%
Total	19,600	3%	44%	19%	9%	25%

III: DROP DEADLINES

The Division looked at Drop Deadlines from Peer Institutions.

College	Length of semester	Drop deadline	Percentage of course prior to drop deadline
Fullerton	17.5 weeks	End of 14 th week	80%
LA City	16 weeks	End of 12 th week	75%
LA Valley	16 weeks	End of 12 th week	75%
San Diego City	16 weeks	End of 10 th week	62.5%
Southwestern	18 weeks	End of 12 th week	66.7%

2.5 Strengths, Weaknesses, Opportunities, Threats (SWOT)

2.5.1 What are the strengths of your program as indicated in the above data?

Overall success rates have increased only 1% over the last 5 years. However, as indicated from the relative success numbers, students that complete a basic skills course at Fullerton College have a higher success rate in comparison to peer institutions. It is clear that successful initiatives designed to support student retention would go a long way to increase student success, and discussions at both the college and division level have focuses on ways to increase student retention. Many of these initiatives are low cost, and easily implemented and place the onus on the students themselves. The Division feels that this is an area that should be investigated more thoroughly.

2.5.2. What are the weaknesses of your program as indicated in the above data?

The Fullerton College Basic Skills program has the lowest retention rates in comparison to peer institutions. The Fullerton College drop deadline is later than those at all of the peer institutions. This discrepancy may be a contributing factor to the lower retention rates. Our overall retention rates have decreased 1% over the last 5 years. The data from examination of placement results shows that almost half of entering students who take the COMPASS placement exam place into MATH 15 (Pre-Algebra.) The division recognizes the need to work with Counseling and our feeder high schools to recognize and resolve this problem.

2.5.3. What opportunities exist for your program based on the above data?

The significant increase in WSCH/FTEF and decrease in FTEF coupled with the decrease in the retention rate indicate that we need to hire more full-time faculty. With momentum building statewide toward innovative approaches to basic skills education, this is an opportunity for the math division to move forward in implementing some new approaches such as restructuring the Math Lab to better support student success, forming an additional Math Skills/intervention center in the 611 computer lab, revising the basic skills curriculum, and creating a new intermediate algebra course for non-STEM majors.

2.5.4 What threats exist for your program based on the above data?

As a result of budgets cuts, there has been a substantial decrease in sections offered resulting in a decrease in enrollment and FTEF. This combined with increased fill rates and WSCH/FTEF does not promote student success. Budget cuts have taken a huge toll on seats available in math courses. Virtually every Fullerton College student needs math classes to meet his or her transfer or degree goals. The practice of making across-the-board budget cuts has undermined the educational progress of many students. Without consideration for the urgency of offering more seats in basic skills mathematics courses, students cannot progress in their education. Discouraged students may abandon their education goals due to lack of needed math classes.

3.0 Student Learning Outcomes Assessment

3.1 What percentage of courses have identified SLOs?

100% of Basic Skills math courses have identified SLOs. The current SLOs have been approved by the curriculum committee and are on schedule for administrative input into Curricunet.

3.2 What percentage of courses have ongoing SLO Assessment?

The Math/CS division has established a three-year cycle for assessing course SLOs. 100% of Basic Skills math courses will be assessed every three years:

- **80% have been assessed within the last three years (2008-2011)**
- **20% will be assessed this year (2011-2012)**
- **All courses will be assessed within the following three years (2012-2015)**

3.3 How has assessment of course level SLOs led to improvements in student learning and achievement?

This first round of assessments has been a learning experience for the department regarding SLO identification and crafting of assessment procedures including communicating assessment instructions to all faculty involved. Discussions have largely focused on how to improve the validity and reliability of the assessment results (see Section 3.5 for specifics). In the next round of assessment as we apply these improvements to the process, we hope to be able to achieve more reliable results and use them to improve student learning and achievement.

3.4 How has assessment of program-level SLOs led to improvements in transfer or certificate/degree awards?

Program-level SLOs are scheduled to be identified by the department and an assessment plan created in 2011-2012.

3.5 What challenges remain to make course and program level SLOA more effective?

Applying the experience and wisdom gained during this first three-year cycle of assessment, the department needs to implement changes to improve the validity and reliability of the course SLOA results, including:

- **Providing students with practice on problems written in a similar format to the SLOA questions**
- **Putting SLOA questions at the beginning of an exam rather than at the end**
- **Standardizing assessment instructions given to faculty**
- **Avoiding multi-step assessment questions to better parse out achievement of each skill**
- **For solving equations-avoid allowing students to choose the correct answer via substitution rather than solving by writing more clever multiple choice answers, or by using free response questions**
- **Program SLOs need to be identified, and an assessment plan constructed and implemented.**

4.0 Evaluation of Progress Toward Previous Goals

4.1 Evaluate steps taken to achieve goals established in the last program review.

- Improvement in the placement of students into appropriate classes: **Members of the division worked with the campus matriculation coordinator to develop an interactive website that would help students be better prepared to take the placement test.**
- We will monitor and respond appropriately to the demand for online and hybrid courses: **We have increased both online and hybrid offerings in the past two years and continue to look at the retention and success in those courses.**
- We will increase the use of appropriate technology in the classroom and in support areas: **The division recently obtained TI-SmartView for use in classroom demonstrations. All faculty were invited to a technology workshop where some faculty shared their experiences with tablet PCs, LaTeX word processing, math websites, and GeoGebra software. A training session devoted to GeoGebra followed.**
- We will support staff development to address changes in learning styles within the mathematics classroom: **Members of the division had opportunities to attend many national and regional professional conferences such as AMATYC, NADE, CMC3-South, etc. The division also sent representatives to multi-discipline conferences as well as workshops on student success strategies and how the brain works so that division members got to be more attuned to the different thinking and learning styles of current students.**
- We will investigate combining MATH 020 and MATH 040 into a single class that eliminates much of the overlapping material: **We've looked at catalog and schedule descriptions from other colleges that have combined algebra courses and are still considering this option along with other possible changes in the basic skills curriculum.**
- We will investigate options to better utilize the arranged hour assigned to each of our basic skills classes: **The division is replacing the arranged hour requirement with some form of support that will better serve our students.**
- We will expand in-class tutoring, especially in classes with large numbers of repeating students: **We have in-class tutors in various sections of Basic Math and Pre-Algebra each semester and graduate student interns in sections of Elementary Algebra.**
- Based on the outcome of our discussions, we will move those initiatives thought viable by the division through the curriculum process: **This semester we are starting to write curriculum to create an alternative course to the traditional intermediate algebra.**

4.2 In cases where resources were allocated toward goals, evaluate the efficacy of that spending.

The only resources allocated toward any of these goals came from the statewide basic skills initiative. This funding paid for math lab tutors, in-class tutors, and graduate student interns for Basic Math, Pre-Algebra, and Elementary Algebra. The effectiveness of in-class tutors thus far has been varied from one class to another.

5.0 Program Goals and Plans

5.1 *Short-term Goals (two year cycle)*

5.1.1 Based on the above data and analyses, identify 1-2 concrete goals, measurable outcomes, and activities that you would anticipate resulting in improvements to the program in the next 2-year cycle.

Goal 1: **Revise Basic Skills Curriculum**

Measurable Outcome: **Increased retention and success in basic skills courses. Increased transfer rate.**

Plan:

- **Create alternative pathways through the math sequence for non-STEM majors**
- **Incorporate “just-in-time remediation” into developmental courses**
- **Develop new math requirement (equivalent to MATH 40) for Associate Degree gen-ed**
- **Develop an accelerated basic skills course sequence in math**
- **Investigate short-term and other options for course offerings**

Goal 2: **Investigate and implement alternative placement models and other support initiatives**

Measurable Outcome: **Increased retention and success**

Plan:

- **Improve math placement processes**
- **Interventions for students who are failing classes to support them in continuing**
- **Mandatory interventions for students who drop/fail classes**
- **Develop orientation tools for potential online math students to better prepare them for online classes**

5.1.2 What specific aspects of these goals can be accomplished without additional financial resources?

Goal 1 can be accomplished with no financial resources. Faculty will design new courses and revise existing courses through the normal curriculum process.

Goal 2 may require some financial support to provide reassigned time/professional expert monies for math faculty to work with students on strategies for success.

5.2 *Long-term Goals (six year cycle)*

5.2.1 Based on the above data and analyses, identify 1-2 concrete goals, measurable outcomes, and activities that you would anticipate resulting in improvements to the program in the next six years.

Goal 1: **Improved facilities for student success**

Measurable Outcome: **Students will have access to the resources they need on campus to complete their math courses in a lab designed for Math**

Plan:

- **In order to accommodate the large number of students using the math lab, the old math lab (room 611) needs to be back under the control of the Math Division as was promised when the lab moved to the LLRC. (The 611 computer lab was created from the western half of the old lab). The Math Division intends to create a Math Success Center in room 611. This center will be staffed by math faculty and available to all basic skills math students, particularly those taking online and hybrid courses, courses using MyMathLab, and any courses incorporating self-pacing or “just-in-**

time” remediation. We intend to continue to operate the Math Lab for more traditional face-to-face tutoring utilizing both faculty and student tutors.

Goal 2: Continue to improve placement and advising

Measurable Outcome: Students will be more appropriately placed in the basic skills sequence and will have access to enhanced counseling/advising opportunities

Plan:

- **The placement process will include a combination of informed self-placement, the placement exam, and high school agreements.**
- **The Math Division will have agreements with area feeder high schools for student placement directly into transfer level math classes provided they have adequate grades on the state exam and required grades in Intermediate Algebra.**
- **A designated faculty member will work as math advisor to students. This faculty member will work with counselors and students to assure students are placed appropriately. This person will also meet regularly with students who are repeating a math course, with the intent of making the student more accountable.**

5.2.2 What specific aspects of these goals can be accomplished without additional financial resources?

None.

Goal 1 may need a substantial financial commitment from the college to remodel/redesign Room 611 into a Math Success Center. On-going money for faculty and student tutors to staff this center will also be needed.

Goal 2 may require some financial support to provide reassigned time/professional expert monies for a math faculty member to work with students on strategies for success.

6.0 Requests for Resources

For any specific aspect of a goal listed in 5.0 that would require additional financial resources, complete the form below.

Type of Resource	Requested Amount	Potential Funding Source
Personnel (1)	a. \$12,000 b. \$20,000	Extended Day budget (reassigned time) Extended Day budget/College funds
Facilities (2)	\$10,000	College funds
Equipment		
Supplies		
Computer Hardware (3)	\$50,000	Basic Skills/Instructional Equipment funds
Computer Software (4)	\$5,000	Division Cash Allocation
Training		
Other		
Total Requested Amount	\$97,000	

6.1. Describe the resource request.

- (1) a. A faculty member would be reassigned 40% to serve as the division's Math Success Advisor. This individual would work with Counseling during registration to assist in placement of students. They would be available to students who had questions about math placement, our basic skills sequence, and graduation and transfer requirements. This individual would also work with students who are struggling in their classes to develop strategies for success. Finally, students would be encouraged to meet with this individual prior to dropping a math class.
- b. Faculty hours would be needed to staff the new Math Success Center.
- (2) We require funds to remodel room 611 into the Math Success Center.
- (3) We would request new or improved computers for students to access online resources in on-campus classes or to complete assignments in hybrid or online courses.
- (4) We would purchase appropriate mathematics tutorial software such as ALEKS, PLATO, or MyMathTest

6.2. What program outcome(s) does the resource request address?

- (1) addresses short term goal 2 and long term goals 1 and 2.
- (2) addresses long term goal 1.
- (3) addresses long term goal 1.
- (4) addresses long term goal 1.

6.3. What measurable outcome(s) will result from filling this resource request?

Increased student success in basic skills courses.

7.0 Executive Summary

The data presented above regarding the Basic Skills program show that over the last 5 years success rates have increased 1%. Over the same time period, retention rates have decreased 1%. However, students who do complete a Basic Skills course at Fullerton College have a higher success rate in comparison to peer institutions (relative success). While the Fullerton College Basic Skills program has the lowest retention rates among peer institutions, our relative success rates are the highest. This result may be partly due to Fullerton College having a later drop deadline than any of its peer institutions. The majority of incoming students who take the placement exam place into MATH 15 (Pre-Algebra). The recent budget cuts have dramatically decreased the number of seats available in basic skills courses. This trend is of particular concern since virtually every Fullerton College student needs several math classes to meet his or her transfer or degree goals.

The Basic Skills program is actively engaged in the exploration, development, and implementation of a variety of initiatives, all of which are intended to increase both retention and success, resulting in an increased transfer rate. These initiatives include: improving initial placement of students in the Basic Skills sequence, restructuring the Math Lab, streamlining the Basic Skills sequence, developing a non-STEM Intermediate Algebra course, and creating a Math Success Center. The Basic Skills program is moving toward a placement process that will include a combination of informed self-placement, the placement exam, and high school agreements. A designated faculty member will work as math advisor to students. Also, mandatory interventions are being considered for students who drop or fail classes. At this time, the manner in which the Math Lab is incorporated into Basic Skills classes is being reorganized with the intent of maximizing the effectiveness of this resource. The division is making progress toward streamlining the Basic Skills sequence so that a student starting at the beginning of the sequence could transition to college level studies in fewer than the four semesters that are currently required. In the fall semester 2013, the Basic Skills program will introduce an alternative Intermediate Algebra course that will be focused on preparing students for statistics and math for liberal arts majors. From the results of recent student surveys, there is considerable demand for such a course. Due to the high demand for remediation and tutoring outside of the classroom, and to provide additional support for online and hybrid classes, the Math Division intends to create a Math Success Center in room 611. This facility could also support “just-in-time remediation” that may be incorporated into developmental courses.

Course level SLOs have already been assessed for the majority of the Basic Skills courses. The remaining assessments will be completed during the Spring 2012 semester. The second round of SLO assessments will begin the following semester. The SLO process has led the division toward various improvements in the assessment of SLOs and implementation of SLO procedures. These changes are intended to improve the validity and reliability of the assessment results.

Division Deans' Program Review Summary Page

I do not concur with the findings contained in this Program Review (include a narrative exception):

I concur with the findings contained in this Program Review with the following exceptions (include a narrative explaining the basis for each exception):

Area of exception:

I concur with the findings contained in this Program Review.