

Mathematics Department

Program Review

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Spring 2009

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LOS ANGELES VALLEY COLLEGE

PROGRAM REVIEW SIGNATURE/TITLE PAGE

DISCIPLINE: Mathematics

PROGRAM NAME: Mathematics

DEPARTMENT NAME: Mathematics

DATE of REVIEW: Spring 2009

REVIEW COMMITTEE:

Department Chair and Program Review Chair: _____

Program Review Committee Members:

1. _____

2. _____

Dean of Academic Affairs: _____

Vice President of Academic Affairs: _____

Mathematics Department Executive Summary Spring 2009

A mathematics education, by providing training in logical reasoning using objective standards, opens up endless opportunities. The mission of the Mathematics Department of Los Angeles Valley College is to provide students with an excellent education in mathematics and to prepare them for university transfer, vocational preparation, basic skills development, and life-long learning in an atmosphere compatible with the spirit of the broader mission of the college that fosters the free and respectful exchange of ideas.

The Mathematics Department is a service department with a mission that mirrors that of the college. The department prepares students for transfer and vocational endeavors as well as addresses the needs of an ever-growing basic skills population. Most LA Valley College math students are not math majors. However, the number of declared math majors averages about 35 each year and on average 23 students declare themselves as transferring to a 4-year college as a math major.

Since the 1980's, the department has seen a rise in the number of classes in basic skills mathematics taught by the department and a corresponding decrease in the proportion of classes in college-level mathematics. During the last 5 to 10 years, the department has made a considerable effort to improve retention and success of students in math classes. To accomplish this, several measures have been taken. The Math Lab was created in Spring 1996 and the majority of students enrolled in math courses who seek out tutoring services get tutored there. The Math Lab has been an integral part of the department since it was first established. The use of this facility by students wishing to get extra help in their mathematics studies continues to grow despite the declining budget to provide services. The department has received three US Department of Education grants: one to create a computer classroom, one to increase success of minority students using technology and one to bridge the achievement gap. The department is also participating in the Basic Skills Initiative and other campus STEM grant projects.

During the 2007-2008 academic year, the department reviewed all of its courses and established course and program level Student Learning Outcomes (SLOs). The following curriculum changes were made: Math 112 was added as a prerequisite to Math 115, the prerequisite for Math 215 was modified, a new Statistics course, Math 227, was created to meet the needs of our UCLA transfers, the Business Calculus curriculum was revised, and the department is currently creating hybrid math courses. SLO rubrics have been developed for Math 115 and the SLO Assessment Cycle is just beginning

There are currently 14 full-time instructors teaching about 29% of the course offerings, and more than 50 adjunct faculty members teaching the remainder of the course offerings. Nine of the 14 regular faculty members teach hourly classes during the day or evening. Two full-time instructors teach evening classes as their regular load and one instructor teaches all of her load in VCAP. The Math Department has 49 ranked hourly rate instructors on the first seniority list and

9 on the second seniority list. The department will begin investigating a way to create a mentoring program for newly hired adjunct instructors. The department's main goal is to attain and sustain at least 20 full-time faculty members. The department is hiring a tenure-track, probationary instructor for Fall 2009, and needs to hire at least one full-time faculty member each year, over the next five to six years, as well as replace any retirements.

The department has two full-time classified employees. The Math Secretary, Cheryl L. Glasband, manages the math office and helps direct students to the appropriate instructor or student support office. The Math Instructional Assistant, Nick Olshansky, assists the Math Lab Faculty Coordinator in running the lab and working with the tutors. The department also hires student workers and tutors to help in the office and Math Lab. When the new Library and Academic Resource Center opens, the department will need to hire an additional Math Instructional Aide to assist with the new Math Basic Skills Lab scheduled to open in that building.

The facilities dedicated to the department are inadequate for the size of the department, its offerings, and the number of students served. Student demand has been increasing, our schedule has been increasing and yet the size of the facility has not grown sufficiently. There should be more dedicated classrooms for the math classes on campus.

There are three major categories of needs of the department to improve its program:

- 1) Increase the Number of Full-Time Faculty
The department needs to hire and maintain a minimum of 20 full-time faculty members. This will ensure that the department is able to consistently provide high standard instruction and meet all of various needs of our students.
- 2) Increase Funding
The department needs an increase in funding for tutors in the Math Lab so services can be provided at a level sufficient to help our students succeed and meet the demands.
- 3) Increase Dedicated Facilities
The department needs more dedicated classroom space to accommodate the large number of sections offered and students served. The department also needs permanent office space for our numerous adjunct instructors.

Over the next 5 years, beginning in Fall 2009, the department will focus on five main goals:

- 1) Increase Student Success and Retention
- 2) Improve the Use of Technology
- 3) Improve Help-seeking Behavior of Our Students
- 4) Increase and Improve Math Lab Services
- 5) Provide More Internal Professional Development for Faculty Members

To tackle these goals, the department will assess what students learn, use data such as tracking success to improve our classes, re-evaluate the course outlines, find ways to incorporate technology into our curriculum both through hybrid offerings and web enhancement of courses, provide more opportunities for students to gain missing mathematical skills, explore more alternate funding sources.

Mathematics Department Program Review

Introduction

The Mathematics Department is for the most part a service department with a mission that mirrors that of the college. The department prepares students for transfer and vocational endeavors as well as addresses the needs of an ever-growing basic skills population. In addition, the department strives to instill upon them skills for life-long learning.

During the time since our last Program Review in 2002, the Mathematics Department has undergone many changes. By the 2003/2004 academic year, the department had grown to 19 full-time faculty members. Due to retirements and new hires the department has shrunk to 14 full-time faculty members. The department is now at the same staffing level as it was in 1999. The number and percentage of adjuncts both continue to grow. The department has noticed the need to provide more mentoring and training for the adjuncts that are hired. The department has continually had to evaluate and reevaluate its offerings in light of the following factors: (1) the explosion of technology, (2) the level of preparedness of the students, (3) the increased diversity of our students in terms of age, ethnic backgrounds, and knowledge of English and (4) the increased student population. Additionally, members of the department have written and received grants to address the needs of our student population. Some faculty members have used computers in the classroom to supplement or enhance their instruction. The department is in the process of garnering approval to offer courses in hybrid format.

History, Mission, and Philosophy

Mathematics Department History

The Mathematics Department was created along with the establishment of the college in 1949. The department grew steadily during the 1950's and 1960's, until there were 17 full-time members and dozens of part-time instructors. The department has consistently offered a full program of transferable lower-division university level classes, together with basic skills classes at the high school level or below.

Beginning in the 1960's, the Department taught a number of courses in computing using an IBM 1620, a punch-card computer, a practice that continued until 1973. By 1962 and 1969, the Department began teaching courses in differential equations and linear algebra, respectively. Our sequence in Mathematics for Business and Social Sciences was also begun by 1962.

The 1970's saw a time of retrenchment in department offerings because of a national slowdown in defense and aerospace activities. To improve our viability in serving students, the department began offering introductory statistics in 1971 and later courses in arithmetic for college students and algebra review. In 1997 prealgebra was added to the curriculum. In 2000, Math 113 and 114 were added to assist students in completing the elementary algebra requirement over a two-semester period. Currently there are 14 full-time instructors and over 50 part-time instructors teaching in the Mathematics Department, with an almost complete turnover of personnel since 1970. In 2001, the department hired a department secretary as well as an instructional assistant in the Math Lab.

Since the 1980's, the department has seen a rise in the number of classes in basic skills mathematics taught by the department and a corresponding decrease in the proportion of classes in college-level mathematics. In fact, from Fall 2001 to Fall 2008, there has been a 45% increase in the number of basic skills sections offered. Looking back further, from Fall 1996 to Fall 2008, there has been a 98% increase in basic skills sections (that is, the number of sections has almost doubled in just over 10 years). Whereas, there has been a 6% decrease in college-level sections from Fall 2001 to Fall 2008, and an 11% decrease from Fall 1996 to Fall 2008. The following tables illustrate this.

Basic Skills Sections

Course Number	Course Name	Fall 1996	Fall 2001	Fall 2008
105	Arithmetic	10	11	17
112	Prealgebra	0	11	17
113	Introductory Algebra I	Not offered	3	10
114	Introductory Algebra II	Not offered	1	6
115	Elementary Algebra	19	21	19
120	Plane Geometry	4	3	5
125	Intermediate Algebra	15	17	23
Total		49	67	97

College Level Sections

Course Number	Course Name	Fall 1996	Fall 2001	Fall 2008
175*	Mathematical Elements of Computer Programming	1	0	Course archived
215	Principles of Math	3	3	2
225	Introduction to Statistics	4	4	8
227	Statistics			Course created
238	Calculus For Business and Social Sciences I	5	5	2
239*	Calculus For Business and Social Sciences II	1	0	Course archived
240	Trigonometry	5	4	4
245	College Algebra	3	5	6
260	Precalculus	3	3	3
265	Calculus with Analytic Geometry I	5	5	4
266	Calculus with Analytic Geometry II	3	3	2
267	Calculus with Analytic Geometry III	4	2	1
270	Linear Algebra	1	1	1
275	Ordinary Differential Equations	1	1	1
Total		38	36	34

*Math 175 and 239 were archived, as there was no longer demand for these courses due to changes in articulation with 4-year colleges. In Fall, 2008, the University of Southern California began accepting Math 238 as the sole transfer requirement for students after the department restructured the course. USC was the only remaining local 4-year school to require Math 239 for Business major transfers.

During the last 5 to 10 years, the department has made a considerable effort to improve retention and success of students in math classes. To accomplish this, several measures have been taken. The Math Lab was created in Spring 1996 and is housed in the Math/Science Building. The use of this facility by students wishing to get extra help in their mathematics studies continues to grow. A Faculty Coordinator, Math Instructional Assistant, and tutors staff the lab. The department has received three US Department of Education grants: one to create a computer classroom, one to increase success of minority students using technology and one to bridge the achievement gap. The first was awarded during the 2002-2003 academic year and was used to create a computer classroom in MS 108 so technology could be incorporated into the mathematics curriculum. In 2005, the department received a 3-year grant to increase success for minority students through the use of technology. The latest grant to bridge the achievement gap was received in Fall 2008. The department is also participating in campus STEM grant projects.

With the creation of the computer classroom in MS 108, some faculty members have begun to fully integrate technology into their courses. Many of the faculty members in the department use web enhancements (such as MyMathLab, Educo, and Course Compass) in their

courses. In Spring 2009, the department approved Math 112, Math 115, Math 125, and Math 225 to be offered in hybrid form. Once the curriculum is fully approved, the department will begin offering these in Spring, 2010. The department is also working on getting Math 245 established as hybrid courses.

The Valley College Accelerated Program (VCAP), formerly PACE, was restructured in 2007 to meet the needs of today's busy adults, enabling them to fulfill their employment and family obligations while earning a college degree. VCAP students take two classes each 8-week session, four classes each semester, and earn an Associate Degree in five semesters or two years. The program offers over 12 sections of math courses each year ranging from Math 112 to Math 238. The VCAP Director closely coordinates math offerings with the Math Department Chair.

Philosophy & Mission

A mathematics education, by providing training in logical reasoning using objective standards, opens up endless opportunities. The mission of the Mathematics Department of Los Angeles Valley College is to provide students with an excellent education in mathematics and to prepare them for university transfer, vocational preparation, basic skills development, and life-long learning in an atmosphere compatible with the spirit of the broader mission of the college that fosters the free and respectful exchange of ideas.

Transfer Education:

- To provide the prerequisite mathematical knowledge needed for completion of education programs in mathematics or applications of mathematics at a 4-year college or university.
- To enable students to meet the general education requirements of a 4-year college or university.

Vocational Preparation:

- To enable students to complete educational programs in mathematics in conjunction with other disciplines at this college to qualify for a vocation or trade.
- To provide the prerequisite mathematical knowledge needed for entrance to a vocational or trade school.

Basic Skills Development:

- To fill any void in a student's pre-college mathematics education.
- To provide a student with needed review or refreshment of pre-college mathematics.

Life-long Learning:

- To introduce students to the beauty and power of mathematics and to inspire them to further pursue mathematics or a related discipline.
- To enable students to earn the Associate of Arts degree in mathematics.
- To enable students to meet the requirements to earn an Associates degree or Certificate at Los Angeles Valley College.

Contribution to the LAVC Community

Most LA Valley College math students are not math majors. However, the number of declared math majors averages about 35 each year and on average 23 students declare themselves as transferring to a 4-year college as a math major. The first two tables¹ below demonstrate the service function the department provides for other departments and programs on campus. The last three tables² on pages 6, 7, and 8 show the math courses that are required for lower division major requirements at CSU Los Angeles, CSU Northridge, and UCLA, our three primary transfer institutions.

Los Angeles Valley College Math Courses and Associate Degrees															
	113 & 114	115	120	125	215	225	238	240	245	260	265	266	267	270	275
Math Competency for AA or AS	X*	X*	X	X	X	X	X	X	X	X	X	X	X	X	X
General Education Plan			X	X	X	X	X	X	X	X	X	X			
AA in Business		E				E	E								
AS in Chemistry											R	R			
AS in Earth Science (Plan A)						E									
AS in Earth Science (Plan B)											R	R	R		
AA in Economics						E	X		X		X	E			
AS in Engineering											R				
AS in Engineering Technology – all options			R					R							
AA in Geography						E									
AS in Geology						E					E				
AA in Liberal Studies					R										
AS in Manufacturing Technology – all options		E	E	E			E			E	E	E	E		
AA in Mathematics										E	R	R	R	E	E
AS in Mechanical Drafting/Design			R												
AS in Physics											R	R	R		E

- X One of the given courses is required
- X* Effective Fall 2009, the course will no longer meet the requirement
- R Indicated course is required
- E Indicated course is an elective

¹ The information in these tables was obtained from the 2008-2009 LA Valley College catalog.

² The information in these tables was obtained from ASSIST in February 2009.

Los Angeles Valley College Math Courses and Certificates

	113 & 114	115	120	125	215	225	238	240	245	260	265	266	267	270	275
Finance							R								
Architecture		E	E	E	E	E	E	E	E	E	E	E	E	E	E
Computer Graphics/Design			R					R							
CSU Breadth					X	X	X	X	X	X	X	X			
Intersegmental General Education Transfer (IGETC)						X	X	X	X	X	X	X	X	X	X
Mechanical Drafting/Design		R													
Mechanical Engineering Technology			R					R							
Manufacturing Technology: Metal Machining		R													
Manufacturing Technology: Numerical Control		R													

X One of the given courses is required

R Indicated course is required

E Indicated course is an elective

Math Transfer Requirements by Major to CSU Los Angeles

	215	225	238	240	245	260	265	266	267	270	275
CSU Certification	X	X	X	X	X	X	X	X			
IGETC		X	X		X	X	X	X	X	X	X
Biochemistry (BS)							R	R	R		
Biology (BS)							R	R			
Chemistry (BA)							R	R	R		
Chemistry (BS)							R	R	R		R
Child Development (BA)	R	X			X						
Civil Engineering (BS)							R	R	R		R
Communicative Disorders (BA)		R			X	X					
Computer Information Systems (BS)		R	R								
Computer Science (BS)							R	R	R	R	
Economics (BA)		R	X				X				
Electrical Engineering (BS)							R	R	R		R
Exercise Science (BS)				R	X	X					
Fire Protection Administration & Technology (BS)		R									
Geography (BA)				R							
Geology (BS)							R	R			
Health Science (BS)					X	X	R				
Industrial Technology (BS)					X	X					
Kinesiology (BS)		R			X	X					
Liberal Studies (BA)	R	R			R						
Mathematics (BA)		R					R	R	R	R	E
Mathematics (BS)		R					R	R	R	R	R
Mechanical Engineering (BS)							R	R	R		R
Mexican-American Studies (BA)	R	R			R						
Microbiology (BS)				R	X	X					
Natural Science (BS)							R	R	R		
Physics (BA)							R	R	R		
Physics (BS)							R	R	R		R
Political Science (BA)		R									
Social Work (BA)		R									
Urban Learning (BA)	R	R			R						

X One of the given courses is required

R Indicated course is required

E Indicated course is an elective

Math Transfer Requirements by Major to CSU Northridge

	215	225	238	240	245	260	265	266	267	270	275
CSU Certification	X	X	X	X	X	X	X	X			
IGETC		X	X		X	X	X	X	X	X	X
Accountancy		R	X			X	X				
Athletic Training		X									
Biochemistry							R	R			
Biology (BA)				S	S	R	R				
Biology (BS)							R	R			
Business Administration		R	X			X	X				
Business Systems			X			X	X				
Chemistry (BA)							R	R			
Chemistry (BS)							R	R	R		R
Child Development		R									
Civil Engineering							R	R	R		R
Communication Disorders		R									
Computer Engineering							R	R	R	R	R
Computer Science							R	R		R	
Construction Management Technology				R	R		R	R			
Economics		R	X				X				
Electrical Engineering							R	R	R		R
Engineering							R	R	R		R
Environmental and Occupational Health		R									
Family and Consumer Science		R									
Finance		R	X			X	X				
Geology		R					R	R	R	R	R
Health Administration			X		X						
Health Education		R									
Information Systems		R									
Information Technology							R				
Kinesiology		R									
Liberal Studies	R	X			X	X					
Management		R	X			X	X				
Manufacturing Systems Engineering							R	R	R		R
Marketing		R	X			X	X				
Mathematics							R	R	R	R	
Mechanical Engineering							R	R	R		R
Nursing		R									
Physics							R	R	R	R	R
Psychology		R									
Radiologic Technology				S	S	R					
Sociology		R									

- X One of the given courses is required
- R Indicated course is required
- S Both courses may be substituted for Math 260

Math Transfer Requirements by Major to UCLA

	225	227	238	245	260	265	266	267	270	275
IGETC	X		X	X	X	X	X	X	X	X
Anthropology	R					R				
Biochemistry						R	R	R		
Biology		R				R	R			
Business Economics						R	R			
Chemistry						R	R	R		R
Cognitive Science						R	R			
Communication Studies	R									
Computer Science						R	R	R	R	R
Earth & Environmental Science						R	R			
Ecology, Behavior & Evolution		R				R	R			
Economics						R	R			
Engineering										
Aerospace Engineering										
Bioengineering										
Chemical Engineering										
Civil Engineering						R	R	R	R	R
Computer Science & Engineering										
Electrical Engineering										
Materials Engineering										
Mechanical Engineering										
General Chemistry						R	R	R		R
Geology						R	R	R		
Geology/Engineering Geology						R	R	R	R	
Geology/Paleobiology						R	R	R		
Geophysics						R	R	R	R	R
Global Studies	X	X								
International Development Studies	X	X								
Marine Biology		R				R	R			
Mathematics										
Applied Mathematics										
Applied Science						R	R	R	R	R
Economics										
Mathematics for Teaching										
Mathematics of Computation										
Microbiology, Immunology & Molecular Genetics						R	R			
Molecular, Cell & Developmental Biology						R	R			
Neuroscience						R	R	R		
Physics						R	R	R	R	R
Physiological Science						R	R			
Political Science		R								
Psychobiology						R	R			
Psychology	X	X	X			X				
Sociology	R		X			X				
Statistics		R				R	R	R	R	

X One of the given courses is required

R Indicated course is required

Program Description

Curriculum

The department has thoroughly reviewed its curriculum since the last program review. Several changes were made to meet the needs and demands of the students as well as to increase student success as they move through the mathematics sequence of courses.

- 1. Mathematics 115 and Mathematics 113/114 (Elementary Algebra):** In an effort to increase student success in these courses, the department added Math 112 as a prerequisite beginning in Fall 2008. The department will begin tracking the success of students in these courses in Fall 2009 to see if the prerequisite has made a difference.
- 2. Mathematics 215 (Principles of Mathematics I):** To align our curriculum with our transfer partners as well as the surrounding colleges inside and outside our district, the department removed the Math 120 prerequisite, but kept on as an advisory. The change was made beginning in Fall 2008. The enrollment in this course has double.
- 3. Mathematics 227 (Statistics):** In Fall 2008, this course was added to our curriculum to address a gap in transfer to UCLA for the Life Science majors. Math 227 has recently been granted UC transfer status and UCLA will articulate this course for most majors in place of their Stat 10 or Stat 13. However, articulation is still needed with our CSU partners to accept Math 227 in place of Math 225. If articulation at the CSUs is granted, the department will begin offering this course in place of Math 225 but until then, one section is scheduled in Fall 2009.
- 4. Mathematics 238 and 239 (Calculus for Business and Social Science):** For many years the department has struggled to offer Math 239. This was primarily due to changes in Business major requirements at the CSUs. USC was the only local 4-year school to still require it. In addition, when the CSUs eliminated the Math 238 requirement for their majors, our enrollment in Math 238 declined drastically. The department successfully worked with USC to revise our outline for Math 238 and garner articulation for this course alone. Therefore, beginning in Fall, 2008, students at Valley who took Math 238 do not need Math 239 to transfer to USC. Math 239 has been archived.
- 5. Distance Education (Hybrid) Courses:** The department is currently reviewing several courses for hybrid status. In Spring 2009, the department approved Math 115 and Math 125 for hybrid status. These courses have been forwarded to the curriculum committee for approval. The department continues to work on a proposal for hybrid status of Math 112, Math 225, and Math 245. At least five faculty members (full-time and part-time) are already qualified to teach online.

Student Learning Outcomes (SLOs)

In Spring 2008, the department wrote course SLOs for each course offered as well as Program SLOs for the AA Degree in Mathematics. In Fall 2008, the department formed a

committee to draft rubrics to use in assessing the SLOs for Math 115. In Spring 2009, several faculty members teaching Math 115 are piloting the rubrics and collecting assessment data. If it is determined that these rubrics are assessing the SLO as expected, implementation will be broadened and rubrics will be created in 2009-2010 for the other courses in the department.

Students

The demographics of the students enrolled in mathematics courses in Fall 2007 are similar to that of the College in relation to gender and primary language.³ LAVC female math students outnumbered LAVC male math students 58% to 42%. English is the primary language of 63% of LAVC math students, Spanish is the primary language for 17% and Armenian is the primary language for 12%. However, the age of students enrolled in mathematics courses and the ethnicities of the students differs slightly from that of the College.⁴ Thirty-six percent (36%) of students enrolled in mathematics courses are under the age of 20 as compared to 23% for the College. Furthermore, 11% of the students enrolled in math courses are 55 or older as compared to only 4% for the College. As to the ethnicity of the students enrolled in math courses, Hispanic students are the largest ethnic group as is the case with the College. However, 50% of the math students are Hispanic, whereas 41% of the student body of the College is Hispanic.

Success and Retention

Since the last program review in 2002, the department continued to see an increase in success rates from 50% to 54% until Fall 2003. From Fall 2003 to Fall 2007 the success rate of LAVC math students decreased from about 54% to about 47%. During this same period the retention rate increased slightly from about 78% to about 80%.

During the 2002-2003 academic year, the department went through a revalidation of the Accuplacer Assessment Test. As a result, the cut scores on this exam were adjusted downward. This is likely to be a cause for the downturn in the success rate. The department plans to go through the revalidation process again during the 2009-2010 academic year.

As noted previously, since the last program review, there has been a shift in the demand for course offerings from college-level to basic skills. This data supports that the department needs to focus more energy on the success of the basic skills population.

Student Survey Results

The results of the Math Program Review Student Survey⁵ of approximately 1200 students conducted in Fall 2008 reveal that students view the Mathematics Department favorably, especially in being well prepared in class. For example, the following are percentages of students in the survey who agree or strongly agree with the indicated statements:

³ Appendix A (Math Department Data Profile) and the Fall 2007 Student Profile Brochure

⁴ Appendix A (Math Department Data Profile) and the Fall 2007 Student Profile Brochure

⁵ See Appendix B (Student Survey Results)

My Valley College math teachers have been well prepared for class	90%
My Valley College math teachers have been approachable	87%
My Valley College math teachers have been available outside class	83%
My Valley College math teachers have explained the material clearly	81%

In addition, 83% of respondents were either satisfied or very satisfied with their educational experience in the Valley College Math Department. This positive experience is in spite of the fact that 64% felt that learning math was either somewhat difficult or very difficult.

The survey also reveals that only 34% of these students have used the Math Lab. The information in Red Canyon also supports this finding (see usage charts on pages 15 and 16). Users of the lab perceive it favorably and indicate that the Math Lab has helped them in their math classes. It was surprising to find that only 34% of the students surveyed used the Math Lab. The department needs to find better ways to encourage students to make better use of the lab as well as helping students adopt better help-seeking behaviors.

One remaining frequent objection of students is the high cost of textbooks. Most students (83%) find their texts useful and the majority of the students (91%) have purchased their book by the first week of the semester. This warrants looking more into how the department utilizes textbooks and employs its policies. Several students also indicated that the department should establish a book loan program.

External Funding

The Math Department has been participating in the Student Success Initiative (a.k.a. Basic Skills Initiative) on campus. The department has requested and received funding to supplement the Math Lab tutoring. The Tutor Infusion Program (TIP) has been created so that more tutors can be hired for Basic Skills classes. Tutors attend class sessions and also conduct out of class tutoring sessions. The tutor assigned to the class also meets regularly with the instructor. Basic Skills funding has been used to provide a TIP lab. This is a separate room, usually a classroom, where basic skills level students can get tutored. The initial anecdotal comments by students is that they prefer the TIP lab because they feel less intimidated as compared to the Math Lab where they might be working next to someone in Calculus.

The most recent US Department of Education Grant is building upon TIP but also incorporates professional development. Faculty members and tutors participating will attend three workshops over the course of the grant. The faculty members will incorporate strategies discussed at these workshops into their courses.

Both the Basic Skills funding and the US Department of Education Grant are fairly new to the department. Over the next couple of years, the department will need to evaluate the effectiveness of the TIP activities. The department should also reach out to the Basic Skills Committee to get funding for activities to help our students develop help-seeking behavior. As with any activity developed using external funding sources, the true measure will be to sustain and institutionalize the effective practices once the funding source is gone. However, this cannot be done solely by the Math Department; the commitment of the College in sustaining these activities is needed.

Faculty and Staff

The Mathematics Department Faculty⁶ is highly diverse ethnically, in academic background, and in teaching styles. Currently there are 14 full-time and more than 50 part-time instructors in the department. The department is in the process of hiring an additional instructor with emphasis in basic skills to meet the growing demands of the student population.

Faculty Staffing Pattern

There are currently 14 full-time instructors teaching about 29% of the course offerings, and more than 50 adjunct faculty members teaching the remainder of the course offerings. Nine of the 14 regular faculty members teach hourly classes during the day or evening. Two full-time instructors teach evening classes as their regular load and one instructor teaches all of her load in VCAP.

In the Fall 2008 semester, there were 138 sections of math classes offered (not including honors sections). Only 40 sections were taught by regularly paid instructors. The remaining 98 sections were taught by hourly rate instructors. This means that 71% of the math classes were taught by hourly rate instructors. Also, the Math Department has 49 ranked hourly rate instructors on the first seniority list and 9 on the second seniority list. In Fall 2008, there were 56 adjunct instructors teaching one or more classes in the department. That is, 80% of the faculty members teaching in the department were adjunct. Many of the part-time faculty members, although well intentioned within the confines of their classes and during office hours, are freeway flyers commuting between many different colleges in the area. They do not have the same commitment to the students, department, or college. The department will begin investigating a way to create a mentoring program for newly hired adjunct instructors.

Full-time instructors teach both basic skills and college-level courses during the day and evening. There is a rotation of advanced math class assignments so as to allow students a choice of instructor, as well as fairness in assignments. Part-time instructors teaching during the day generally teach basic skills courses, while those teaching in the evening teach both levels.

The department is in the process of hiring another tenured-track faculty member for Fall 2009. This will help improve the full-time/part-time ratio and will also benefit the students, the department, and the college. The chart below indicates the percent of FTEF taught by full-time and part-time faculty members in the department.

⁶ See Appendix C (Faculty Information)

1. Your department's typical FTE Fall semester allocation:	34.0
2. The number of full-time faculty members in your department:	14.0
3. The FTE for reassigned time for your Chair assignment	0.8
4. The FTE for any other faculty reassignments in your department	0.4
5. Add together #3 & #4	1.2
6. Subtract #5 from #2 (this is the amount of FTE taught by full-time faculty)	12.8
7. Divide #6 by #1 and then multiply by 100 (this is the percent of FTE taught by full-time faculty)	37.6%
8. Subtract #7 from 100 (this is the percent of FTE taught by hourly rate faculty)	62.4%

Support Staff

The department has two full-time classified employees. The Math Secretary, Cheryl L. Glasband, manages the math office and helps direct students to the appropriate instructor or student support office. The Math Instructional Assistant, Nick Olshansky, assists the Math Lab Faculty Coordinator in running the lab and working with the tutors. The department also hires student workers and tutors to help in the office and Math Lab.

Staffing Plan

The department's goal is to hire enough faculty members over the next five years to maintain 20 full-time faculty members. This would mean that the department hires at least one new faculty member each year not including replacement of any retirements that might occur.

- Fall 2009 1 hire in process during Spring 2009 to hire a person with a Basic Skills emphasis
- Fall 2010 2 hires (one to replace an expected retirement and one with Statistics emphasis)
- Fall 2011 at least 1 hire
- Fall 2012 at least 1 hire
- Fall 2013 at least 1 hire
- Fall 2014 at least 1 hire

Facilities, Equipment, and Technology

Dedicated Facilities

The Mathematics Department is housed in the Math Science Building and has use of seven classrooms, one lab, and one shared classroom with Child Development (Child Development uses two additional classrooms within the building). The department also makes regular use of bungalows, in particular, B1, B2, B5, B7, B8, B9 and B10. The seven rooms in the Math Science Building are definitely insufficient for the number of sections the department offers every semester. Even when the bungalows are utilized, math classes are held in various other bungalows and other buildings on campus. When the new Library and Academic Resource Center is completed, there will be a new computer classroom designated to the Math Department.

Full-time instructors share office space, two to an office in most cases. It is convenient to have the instructors' offices in the same building. A workroom, used for small meetings, also acts as storage for department office supplies and the use of a scantron machine. This workroom is adjacent to the faculty and staff offices. In Spring 2007, the department was allotted office space (Bungalow 1A) for part-time instructors to meet with their students during office hours. Some part-time instructors still choose to meet their students in the classroom or the Math Lab, but for those who use the office, they have file cabinet space, computers, a printer, desks, and a phone.

Facilities Recommendations

The facilities dedicated to the department are inadequate for the size of the department, its offerings, and the number of students served. Student demand has been increasing, our schedule has been increasing and yet the size of the facility has not grown sufficiently. There should be more dedicated classrooms for the math classes on campus. With the Life Science Building renovation being completed in Fall 2009 and the science labs moved to the Allied Health & Science building, some classrooms in Life Science should be allotted to the Math Department.

The number of part-time employees has also increased in the last couple of years and there is no place for them in the building although there is temporary space in Bungalow 1A. A permanent office space for part-time instructors should also be set aside from the vacated space in other buildings.

Special Equipment and Materials

Each classroom in the Math Science Building is equipped with a multi-media cabinet that contains a laptop computer, remote for the mounted data projector, dvd/vcr player, and needed cables for connections. The Math Department has one computer classroom (MS 108) with 32 student stations. The Math Lab (MS 106) has 12 PC computers for student use as well as one computer running Red Canyon used to log students into the lab. The Math Instructional Assistant has his own dedicated computer and printer. The Faculty Offices have 13 PC

computers, 3 MAC computers, and one shared printer that is located in MS 106A. The Math Department Secretary has her own computer and printer. Through external grants, the department has been able to purchase laptops for faculty use: 3 MACs and 3 PCs. The department also owns a portable data projector. The office has a scantron machine shared with the departments nearby. All of these computers need to be upgraded on a 5-year cycle.

Campus Partners and Resource Utilization

Academic Support Services

The majority of students enrolled in math courses who seek out tutoring services get tutored in the Math Lab. Some students also make use of the tutoring through the Learning Center. There are several differences between how students get helped in these two locations. The Math Lab works on a first-come, first-serve basis, whereas the learning center schedules one-on-one appointments. Also, the Math Lab is part of the mathematics department with a full-time math faculty member responsible for staffing and training the tutors. There is no full-time or part-time math faculty member in the Learning Center to oversee the mathematics part of the tutoring there.

Math Lab

The Math Lab has been an integral part of the department since 1996 when it was first established. A full-time math faculty member supervises the lab with a 0.2 FTE reassigned time for that work. A full-time Math Instructional Assistant who assists the faculty member with the day-to-day business of the lab staffs the lab. Tutors and student workers also staff the lab and provide peer tutoring to students enrolled in all levels of mathematics. Several full-time and part-time faculty members volunteer their time in the Math Lab.

The Math Lab has 12 PCs for student use. The primary focus for using these computers is for students to use the various web-based software required by instructors for class assignments. The lab also has several tutorial software packages installed for students to use in the lab. Students are not able to print in the Math Lab.

The Math Lab has hundreds of math videos that students may watch in the lab or check out for use at home. These videos correlate to the texts used by the majority of those in the department. However, they are topic specific, so any student can make use of them to get help.

In Fall 2008, the department conducted a Math Lab Survey⁷. Students using the lab during a one-week period were asked to participate. There were 73 survey responses. Overwhelmingly, 98% of those surveyed indicated they were very satisfied with their Math Lab experience. Additionally, comments from those responding indicated a need for evening hours to extend beyond 6 pm Monday through Thursday and expansion of the Friday and Saturday hours.

The Math Lab usage is increasing in spite of a declining budget. See the charts below⁸ to illustrate the lab usage compared to our budget. The department is stretched thin on resources and any further reductions in funding for the lab will mean a severe deterioration of services. The department has been fortunate to have a US Department of Education grant beginning Spring 2009 to help provide additional tutoring to basic skills students not included in the information below. The department was also fortunate during Fall 2008 to have been able to use Basic Skills funding for the same purpose.

⁷ See Appendix D (Math Lab Survey and Results)

⁸ Information on lab usage obtained from Red Canyon and budget information is from BW.

Winter Comparison			
Year	Headcount	Total Contact Hours	Budget
2006	165	1,013	Unable to determine
2007	156	735	\$7500
2008	212	1,503	\$6258
2009	185	1,762	\$5856

Summer Comparison			
Year	Headcount	Total Contact Hours	Budget
2006	330	2455	\$11,000
2007	303	2607	\$11,242
2008	343	3102	\$7,599

Fall & Spring Comparison			
Year	Headcount	Total Contact Hours	Budget
2006/07	1478	11,548	\$68,483
2007/08	2048	18,806	\$62,688
2008/09*	1548	11,586	\$62,688

* Includes information up to Spring Break.

The data supplied from the Office of Research and Planning also shows that students who demonstrate help-seeking behavior by attending the Math Lab have higher success and retention rates as compared to those who do not make use of the Math Lab. The following chart illustrates these differences:

Success and Retention Rate Comparison⁹

Semester	Success Rate w/out Using Math Lab	Success Rate with Using Math Lab	Success Rate Difference	Retention Rate w/out Using Math Lab	Retention Rate with Using Math Lab	Retention Rate Difference
Fall 2006	45%	58%	13%	76%	82%	6%
Spring 2007	46%	61%	15%	73%	82%	9%
Fall 2007	45%	56%	11%	79%	83%	4%
Spring 2008	47%	56%	9%	77%	81%	4%
Fall 2008	47%	58%	11%	79%	81%	2%

Math Lab Recommendations

In the next 5 years, the Math Lab needs to find additional ways to increase lab usage by students. The data clearly shows that students who use the lab do better than those who do not. However, getting students into the lab is just once piece of what needs to be done; the department needs to find ways to assist them in developing help-seeking behavior. In order to serve more students and serve them better, our lab funding needs to increase and become a

⁹ Information obtained from the Office of Research and Planning, based on DEC 4/14/09.

priority for the college. With additional funding, the lab could offer workshops for students to help them prepare for exams or get through difficult topics (such as percents and factoring). The lab hours could also be expanded to meet the needs of the working student.

When the new Library and Academic Resource Center is completed, there will be space for a Math Basic Skills Lab. This too will present challenges. In order to staff both this new lab and our existing lab (which will be primarily for those in transfer level courses), the department will need an additional Math Instructional Assistant as well as more reassigned time for a full-time faculty member to supervise that lab.

Lastly, the department needs to provide more ongoing tutor training. Learning Skills 26 was created to provide training to newly hired tutors. Currently, tutors meet with the Math Lab Supervisor monthly for training. However, well-trained tutors are essential to the success of the students who come for help. Additional resources are needed to provide this training.

Learning Center

In Spring 2008, the Learning Center served 89 students with math tutoring. These students were served on a walk in basis and by appointments for one-on-one tutoring. These students represent only about 10% of the number of students seeking out tutoring in math.

Library

After researching the facilities of the library, it was noted that the library keeps an updated supply of books on reserve for courses currently offered. Within the library stacks, there is a nice collection of resource books ranging from pre-school-level math through higher-level math such as Topology, Chaos Theory, and Real Analysis. In addition, the library has an online database of Math textbooks that are available at the LAVC library as well as in the other district libraries. Faculty and students can easily access the database. Although the department does not assign research projects, some students use the collection as a resource to help them understand topics discussed in the classroom.

The department will work with library once the new library is completed to place multiple copies of texts on reserve instead of the one copy that is currently there. The library should acquire the complete Schaum's Outline Series and Dover Series, funding permitted.

Needs Analysis and Recommendations

Summary of Department Needs and Recommendations

There are three major categories of needs of the department to improve its program:

- 2) **Increase the Number of Full-Time Faculty**
The department needs to hire and maintain a minimum of 20 full-time faculty members. This will ensure that the department is able to consistently provide high standard instruction and meet all of various needs of our students. Because the mission of the department mirrors that of the college, the department needs to be able to focus energies on helping the basic skills students as well as those preparing for transfer.

- 2) **Increase Funding**
The department needs an increase in funding for tutors in the Math Lab so services can be provided at a level sufficient to help our students succeed and meet the demands.

- 3) **Increase Dedicated Facilities**
The department needs more dedicated classroom space to accommodate the large number of sections offered and students served. The department also needs permanent office space for our numerous adjunct instructors.

Department Goals

Over the next 5 years, beginning in Fall 2009, the department will focus on five main goals:

- 1) **Increase Student Success and Retention**
- 2) **Improve the Use of Technology**
- 3) **Improve Help-seeking Behavior of Our Students**
- 4) **Increase and Improve Math Lab Services**
- 5) **Provide More Internal Professional Development for Faculty Members**

To tackle these goals, the department will assess what students learn, use data such as tracking success to improve our classes, re-evaluate the course outlines, find ways to incorporate technology into our curriculum both through hybrid offerings and web enhancement of courses, provide more opportunities for students to gain missing mathematical skills, explore more alternate funding sources.

Action Grid

Goals	Activities
Increase Student Success and Retention	<p>Conduct ongoing SLO Assessment Cycles for all courses.</p> <p>Revalidate the Accuplacer cut scores.</p> <p>Evaluate our textbook policies to address the concerns of the students and respond to the high cost of textbooks.</p> <p>Grow to and maintain a minimum of 20 full-time faculty members.</p>
Improve the Use of Technology	<p>Upgrade computers in faculty offices, the Math Lab, and the computer classroom on a regular 5-year cycle.</p> <p>Encourage faculty members to web enhance their courses or get trained to teach the newly created hybrid courses.</p>
Improve Help-seeking Behavior of Our Students	<p>Seek Basic Skills funding to develop activities to help students become self-regulated learners and learn help-seeking behaviors.</p> <p>Conducts a department workshop to learn about results of the research conducted by Teresa Lai, a PhD candidate, and utilize that data to provide better services to our students.</p>
Increase and Improve Math Lab Services	<p>Seek an increase in funding for tutors in the Math Lab.</p> <p>Provide workshops/clinics conducted by peer tutors.</p> <p>Seek an increase in reassigned time for faculty members to supervise the Math Lab.</p> <p>Provide more tutor training.</p>
Provide More Internal Professional Development for Faculty Members	<p>Establish a part-time mentoring program.</p>