COMPREHENSIVE INSTRUCTIONAL PROGRAM REVIEW

Mathematics Discipline
Moreno Valley College
Academic Year 2010-2011

RCCD | RIVERSIDE COMMUNITY COLLEGE DISTRICT

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Web Resources:
http://www.rccd.edu/administration/educationalservices/ieffectiveness/Pages/ProgramReview.aspx

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PROGRAM REVIEW
MATHEMATICS DISCIPLINE
ACADEMIC YEAR 2010-2011

A. Mission and Relationship to the College(s)

The Mathematics discipline clearly serves the mission of Moreno Valley College by providing instruction and programs designed to meet the needs of transfer, occupational, technical, and under-prepared students.

The Mathematics Department of Moreno Valley College empowers a diverse community of students to develop mathematical potential to meet their academic, professional, and lifelong learning goals.

The mission of Moreno Valley College reads as follows:

Responsive to the educational needs of its region, Moreno Valley College offers academic programs and students support services which include baccalaureate transfer, professional, pre-professional, and pre-collegiate curricula for all who can benefit from them. Life-long learning opportunities are provided, especially, in health and public service preparation.

The Mathematics Department serves the following areas of the College Mission:

Baccalaureate Transfer – Courses include Trigonometry, College Algebra, Statistics, Pre-Calculus, Calculus I, II, and III, Differential Equations, Linear Algebra

Professional Courses

- Pre-Algebra is required for Dental Assistant
- Intermediate Algebra and Trigonometry are required for Engineering Technician
- College Algebra and Trigonometry are required for Engineering Technology
- Math is required as a prerequisite to Nursing

Pre-Professional and Pre-Collegiate Courses

- Elementary Algebra
- Pre-Algebra
- Arithmetic

AA/AS Graduation Requirement - Intermediate Algebra

General Education – Any math course numbered 1-49 may fulfill one of the course requirements for the Language and Rationality (Communication and Analytical Thinking) requirement.

Prerequisites

- **Intermediate Algebra is prerequisite for Chemistry 1A and 1AH**
- **Elementary Algebra is prerequisite for Chemistry 2A and 3**
- **Calculus I is prerequisite for Physics 2A and 4A**
- **Calculus II is prerequisite for Physics 4B and 4C**
- **Elementary Algebra is prerequisite for Physics 10**

The mathematics discipline strives to provide access to mathematics courses for students by offering additional sections of in-demand courses, providing morning and evening sections, and weekend sections at Ben Clark Training Center. The mathematics discipline offers multiple levels of mathematics courses serving as prerequisites for courses in the Chemistry, Physics, Engineering, Business, Economics, Nursing, Computer Science and Social Science disciplines.

Discipline members strive to provide an effective learning environment for students, to exhibit excellence in teaching, and to be responsive to the needs of the student populations served.

The mathematics discipline members have agreed to assess all levels of mathematics courses that we offer by Fall 2012. Various assessment projects are currently in progress as a means of improving our instruction and increasing our student's success rates in our courses.

B. History

When the Moreno Valley Campus opened, in order to support the educational needs of an increasing population in the local community, the discipline was encouraged to grow.

Faculty: Originally, the math discipline consisted of one full time faculty, increasing to three in 1998. In 1999, there were four full time math faculty. By 2011, the discipline consisted of eight full time math faculty.

Course offerings: Growth in course section offerings was consistent, averaging 10% to 25% from 1991 through 2005. From 2005 to 2011, our growth rate has tapered down because of the recent statewide budget reductions. We have been reducing sections to meet our budget limitations.

Goals: In the previous district program review, the discipline identified a number of goals:

1) Discipline members will continue assessment work, focusing on the use of embedded common test questions and item analysis.

2) Riverside math faculty will hold a workshop for the discipline on rubric development and assessment.

3) Discipline members will develop SLOs for STEM, non-STEM, and developmental areas.

4) Discipline members will pilot proctored testing for online classes.

5) Discipline members will continue to explore an alternative course for Intermediate Algebra as the AA degree requirements change; explorations into offering Intermediate Algebra in other modalities are underway.

6) Discipline members will continue to improve success and retention for developmental courses. The discipline would like to perform additional research on persistence in the developmental sequence, including investigating the effects of adding prerequisites and of using supplemental instruction, classroom assistants, and tutorial services.

7) Discipline members will review upper-level course offerings among the three campuses.

Goal	**Status**
1. Discipline members will continue assessment work, focusing on the use of embedded common test questions and item analyses.	1. The Moreno Valley Math Discipline has been continuously offering common final exams in Math 52 since 2000. We have performed item analysis on test questions and developed directed learning activities to address the test items that are most often answered incorrectly. We have also been embedding common final exam questions in math 64 since 2010. We are currently discussing embedded test questions in Math 35 (and other courses) final exams.
2. Riverside math faculty will hold a workshop for the discipline on rubric development and assessment.	2. Moreno Valley math faculty see the value in holding workshops to discuss rubric development and the use of rubrics in grading embedded final exam questions. We intend to hold workshops by spring 2013.
3. Discipline members will develop PLOs for STEM, non-STEM, and developmental areas.	3. This project did not occur. There are district wide efforts to develop a transfer pattern for math majors and to define PLOs to this end.
4. Discipline members will pilot proctored testing for online classes.	4. In fall 2008, the Moreno Valley math faculty successfully piloted proctored testing for online classes. The department currently requires that for all online classes one midterm and final be proctored. The Math Lab has been the location for the proctored tests.

5. Discipline members will continue to Explore an alternative course for Intermediate Algebra as the AA degree requirements change; explorations into offering Intermediate Algebra in other modalities are underway.	5. The discipline chose not to pursue this goal at this time.

6. Discipline members will continue to improve success and retention for developmental courses. The discipline would like to perform additional research on persistence in the developmental sequence, including investigating the effects of adding prerequisites and of using supplemental instruction, classroom assistants, and tutorial services.	6. We have used supplemental instruction tutors in math 52 and math 35. There were no measureable improvements in student success or retention. Detailed results are in Appendix B. Department faculty worked with Institutional Research to study persistence in mathematics for students starting 4, 3, 2, and 1 level(s) below transferable math. See Section C for these data. One outcome of this research was to develop a Pre-statistics course which will lessen possible exit points for students placing below statistics on the College's math placement test. A further study was conducted on the success of the mathematics modules. However, generalizations from the results of this study are impossible due to the sample size. Due to section cuts, the department will be offering fewer Math 63 and 64 sections and instead will offer Math 65.
7. Discipline members will review upper-level course offerings among the three campuses.	7. The discipline district-wide has not had a great deal of coordination on course offerings. However, at Moreno Valley, due in part to the new scheduling grid, the department has been working closely with the Physical Sciences, Life Sciences, and Chemistry Departments to schedule classes in ways that best serve students.

Report on Jumpstart – Summer 2010

Participating Faculty:

Bonnie Montes – Counselor

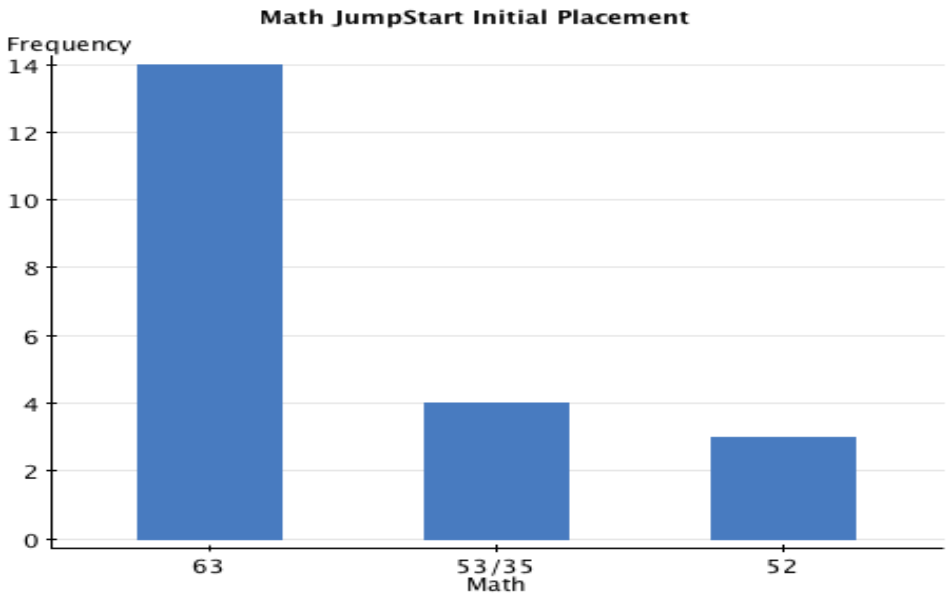
Jason Wong – Math

Ignacio Alvarez – Student Assessment Center

Jumpstart took place during the six-week summer semester. Students were targeted who placed into the lowest levels of math, although some students who placed at slightly higher levels who were interested were allowed to enroll. The students met for about an hour each day with Dr. Jason Wong, their math instructor. They were also given the opportunity to attend Supplemental Instruction sessions, led by a peer-tutor once per week in each of the subject areas. The SI sessions were voluntary, but well attended, usually having about 17 students at each. Students all took the Accuplacer diagnostic before JumpStart and took the Accuplacer for placement at the end of the program. Supplemental Instruction training for faculty and the SI tutors took place, and an orientation was held for the students and their parents, prior to the start of the program.

JumpStart Enrollment

A total of 23 students enrolled, 21 having pre-and post-test information.



Preliminary Results

Math students advanced through Accuplacer results.

- Math = 60 % of the students that retested showed an improvement to their final Math placement (6 students did no retest).

Gains in Course Level by Initial Placement				
Initial Placement	No change	One course gain	Two course gain	Three course gain
Math 63	5	2	5	2
Math 52	3	1		
Math 53/35	4			

Altogether, the JumpStart program in summer 2010 allowed students to potentially skip courses totaling 69 units in math.

In summer 2011, the JumpStart program was offered following essentially the same format, with the addition of counselor support in enrolling for the fall semester, as described above. Despite recruitment efforts, only sixteen students initially enrolled in the program, with eleven students finishing and retaking assessment tests. The results of Accuplacer retests were that students were able to progress 110 units without taking courses (60 English, 20 Reading, and 30 Math) or the equivalent of approximately 9 FTES. This resulted in a potential cost savings of approximately $40,000. Although the results were more modest during this iteration of the program, it still resulted in a cost savings since the total cost of the program was approximately $17,000.

Although students completing the JumpStart program in 2010 had difficulty in registering for English and math courses in the subsequent fall 2010 semester, those students who did enroll in Math and English before Fall 2011 were generally successful in their courses. Nine of the eleven students in the 2011 JumpStart cohort met with a counselor to develop an educational plan for the fall 2011 semester but there is no grade information available for these students.

Early Assessment Program

The Early Assessment Program (EAP) is a collaborative effort among the State Board of Education (SBE), the California Department of Education (CDE) and the California State University (CSU). The program was established to provide opportunities for students to measure their readiness for college-level English and Mathematics in their junior year of high school, and to facilitate opportunities for them to improve their skills during their senior year. The Moreno Valley

Mathematics Discipline has agreed to pilot the use of EAP scores for student placement in fall 2011. Students who are college-ready according to the EAP will be allowed to enroll in the following Math courses: 11 and 12. Students can also enroll in Math 36 upon verification that the student has successfully completed geometry in high school.

Algebra for Statistics

Across the U.S. students placing at remedial levels of mathematics are failing to reach college level mathematics courses. Indeed, students who place three or more levels below a college transferable math class have only a 10% chance of ever passing a "gatekeeper" course (Bailey, Jeong, and Cho, Referral, Enrollment, and Completion in Developmental Education Sequences in Community Colleges (CCRC Working Paper No. 15), 2008).

The problem seems to lie in the number of exit and entrance points along the prerequisite path. At each point, the likelihood that successful students do not enroll in the next course in the sequence needs to be factored in, causing a multiplier effect that lowers the chances of students successfully reaching college level. Data from the Riverside Community College District (Fall 2006 to Spring 2010) support the national findings and can be found in Section C.

One proposed solution to the leaky prerequisite pipeline is "accelerated remediation". This term has many meanings, but one that the mathematics discipline at RCCD has focused on is an intensive pre-requisite course that is being designed to offer "just in time" learning for concepts that students will need to successfully complete a college-level statistics course. This course will mirror one that was developed by professor Myra Snell at Los Medanos College in California. Data collected by Snell showed students completing Pre-statistics rather than the standard prerequisite path succeeding at higher rates in Statistics.

Using topics such as exploratory data analysis, data collection, numeracy, algebraic reasoning, mathematical modeling with functions and density curves, and graphical reasoning, a new six-unit course will be developed having no required pre-requisite course. Three district math faculty, two from Riverside and one from Moreno Valley will participate in a six-month community of practice with faculty from twenty-two other California Community Colleges to develop a course outline and learning activities for this course. One section of this course will be piloted at Moreno Valley College during the spring 2012 semester. Institutional Research will assist in recruiting a stratified sample of students placing at various math levels for participation in this pilot. Results of the pilot will be analyzed and used in making decisions on continuing and/or expanding other such course offerings.

All of the grant and curriculum work, participation in programs such as Jump Start and Early Assessment, and expansion of math lab services are focused towards improving student access, successful completion, retention, and persistence. Institutional data are tracked for these projects and are discussed by faculty on a regular basis in efforts to identify ways to better achieve student learning outcomes.

C. Data and Environmental Scan

Total Enrollments from Winter 2008 to Fall 2010

	W 2008	Sp 2008	Su 2008	F 2008	W 2009	Sp 2009	Su 2009	F 2009	W 2010	Sp 2010	Su 2010	F 2010
Math 90A	13	37	14	20	14	28		26	17	21		29
Math 90B	7	19	12	23	9	18		12	12	17		19
Math 90C	2	10	5	12	6	7		4	8	12		11
Math 90D	0	11		12		13		8		19		20
Math 90E		4		9		6		5		5		9
Math 90F		2		8		3		2		4		6
Math 63	45	272	82	244	42	319	78	148	50	303	81	141
Math 64	25	152	56	205	39	175	77	184	41	160	86	196
Math 52	37	451	125	578	51	650	161	638	45	645	163	579
Math 53		124	39	88		128	40	94		136	46	96
Math 35	47	542	154	680	91	697	163	722	92	697	170	761
Math 36	35	64	30	90		66	35	99	44	74	49	98
Math 11	15	121	48	187	45	122	36	214	42	120	31	235
Math 12	16	97	31	109	28	111	47	134	41	115	44	122
Math 10		44	17	61	34	41		72		46		84
Math 1A		29		22		61		15		26		38
Math 1B		29				45		37		46		32
Math 1C				21				35				12
Math 2		21				13				25		
Math 3		18				14				35		

Success Rates and Retention Rates

	W 2008		Sp 2008		Su 2008		F 2008		W 2009		Sp 2009	
	R	**S**	R	**S**	R	**S**	R	**S**	R	**S**	R	**S**
Math 90A	92%	**39%**	95%	**35%**	93%	**71%**	85%	**60%**	57%	**50%**	89%	**50%**
Math 90B	57%	**43%**	79%	**47%**	100%	**58%**	91%	**52%**	89%	**33%**	94%	**61%**
Math 90C	100%	**50%**	90%	**60%**	80%	**80%**	92%	**67%**	100%	**100%**	71%	**43%**
Math 90D	NA	**NA**	82%	**36%**	NA	**NA**	83%	**75%**	NA	**NA**	69%	**23%**
Math 90E	NA	**NA**	100%	**100%**	NA	**NA**	100%	**78%**	NA	**NA**	83%	**33%**
Math 90F	NA	**NA**	100%	**100%**	NA	**NA**	100%	**100%**	NA	**NA**	67%	**33%**
Math 63	87%	**62%**	71%	**47%**	96%	**71%**	85%	**52%**	91%	**71%**	84%	**58%**
Math 64	96%	**88%**	81%	**47%**	95%	**77%**	91%	**67%**	90%	**77%**	85%	**42%**
Math 52	76%	**41%**	67%	**38%**	82%	**54%**	79%	**46%**	84%	**69%**	74%	**47%**
Math 53	NA	**NA**	84%	**62%**	92%	**85%**	83%	**55%**	NA	**NA**	78%	**52%**
Math 35	81%	**60%**	76%	**54%**	89%	**66%**	82%	**57%**	63%	**41%**	74%	**44%**
Math 36	83%	**63%**	86%	**73%**	97%	**80%**	74%	**57%**	NA	**NA**	64%	**46%**
Math 11	93%	**80%**	77%	**63%**	90%	**81%**	81%	**62%**	98%	**96%**	76%	**58%**
Math 12	88%	**69%**	71%	**62%**	90%	**61%**	70%	**42%**	93%	**61%**	76%	**61%**
Math 10	NA	**NA**	80%	**61%**	84%	**71%**	85%	**71%**	91%	**77%**	34%	**17%**
Math 1A	NA	**NA**	93%	**79%**	NA	**NA**	86%	**59%**	NA	**NA**	62%	**41%**
Math 1B	NA	**NA**	76%	**66%**	NA	**NA**	NA	**NA**	NA	**NA**	69%	**64%**
Math 1C	NA	**NA**	NA	**NA**	NA	**NA**	86%	**81%**	NA	**NA**	NA	**NA**
Math 2	NA	**NA**	71%	**62%**	NA	**NA**	NA	**NA**	NA	**NA**	92%	**85%**
Math 3	NA	**NA**	89%	**78%**	NA	**NA**	NA	**NA**	NA	**NA**	79%	**57%**

	Su 2009		F 2009		W 2010		Sp 2010		Su 2010		F 2010	
	R	S	R	S	R	S	R	S	R	S	R	S
Math 90A	NA	**NA**	81%	**65%**	65%	**65%**	76%	**48%**	NA	**NA**	83%	**59%**
Math 90B	NA	**NA**	92%	**33%**	92%	**75%**	94%	**47%**	NA	**NA**	95%	**53%**
Math 90C	NA	**NA**	100%	**100%**	100%	**63%**	92%	**50%**	NA	**NA**	91%	**18%**
Math 90D	NA	**NA**	75%	**50%**	NA	**NA**	84%	**58%**	NA	**NA**	75%	**50%**
Math 90E	NA	**NA**	60%	**40%**	NA	**NA**	80%	**80%**	NA	**NA**	###	**89%**
Math 90F	NA	**NA**	100%	**100%**	NA	**NA**	100%	**100%**	NA	**NA**	83%	**67%**
Math 63	80%	**62%**	84%	**59%**	92%	**72%**	83%	**47%**	70%	**30%**	94%	**70%**
Math 64	94%	**68%**	90%	**59%**	98%	**85%**	80%	**44%**	88%	**61%**	91%	**68%**
Math 52	84%	**62%**	78%	**47%**	73%	**51%**	75%	**44%**	78%	**42%**	75%	**46%**
Math 53	98%	**85%**	68%	**43%**	NA	**NA**	72%	**53%**	65%	**39%**	91%	**76%**
Math 35	82%	**62%**	73%	**44%**	69%	**36%**	74%	**46%**	74%	**44%**	78%	**42%**
Math 36	77%	**51%**	75%	**50%**	89%	**64%**	81%	**51%**	92%	**90%**	84%	**48%**
Math 11	61%	**28%**	82%	**64%**	83%	**77%**	79%	**68%**	71%	**58%**	66%	**46%**
Math 12	83%	**75%**	84%	**58%**	68%	**63%**	72%	**46%**	68%	**48%**	80%	**64%**
Math 10	NA	**NA**	75%	**51%**	NA	**NA**	61%	**48%**	NA	**NA**	69%	**55%**
Math 1A	NA	**NA**	27%	**27%**	NA	**NA**	58%	**42%**	NA	**NA**	47%	**32%**
Math 1B	NA	**NA**	54%	**35%**	NA	**NA**	68%	**28%**	NA	**NA**	72%	**38%**
Math 1C	NA	**NA**	100%	**77%**	NA	**NA**	NA	**NA**	NA	**NA**	92%	**50%**
Math 2	NA	**NA**	NA	**NA**	NA	**NA**	84%	**76%**	NA	**NA**	NA	**NA**
Math 3	NA	**NA**	NA	**NA**	NA	**NA**	49%	**34%**	NA	**NA**	NA	**NA**

Of major concern to the Mathematics Department is to identify ways to increase the success rates of students. The department plans to focus on this area during the 2011-12 academic year in part by holding sessions for faculty to have an opportunity to discuss student success.

The number of students taking the series of Math 90 courses is too small to make a generalized statement, but its self-paced modular curriculum and no gap approach generally positively impacts student success. Due to section cuts, in fall 2011 the department will be offering fewer Math 63 and 64 sections and serving more students in the Math 90 modules sections.

The department is also concerned about persistence. The table below illustrates the very leaky math pipeline at RCCD (Fall 2006 to Spring 2010). For example, when 761 students started in Math 63, of the 331 who successfully completed the course, only 126 continued to Math 64. Of those 126 students, 101 were successful in Math 64 and of those 101, 65 continued to Math 52. Of those 65 students, 50 were successful in Math 52 and of those 50, 24 continued to Math 35. Of those 24, 17 were successful in Math 35. Finally, of those 17 students, only 7 continued to college-level math, with only 6 of those being successful. The department is working on a project to alleviate this problem and to reduce the number of possible exit points for students through the Pre-statistics course development and pilot (see Section B above).

	Success	Non Success	Successful No Progress	Total
MAT-63	331	430	0	761
MAT-64	101	25	205	126
MAT-52	50	15	36	65
MAT-53/35	17	7	26	24
CL	6	1	10	7
	Success	**Non Success**	**Successful No Progress**	
MAT-64	44	45		89
MAT-52	17	6	21	23
MAT-53/35	6	2	9	8
CL	3	2	1	5
	Success	**Non Success**	**Successful No Progress**	
MAT-52	627	557		1184
MAT-53/35	173	60	394	233
CL	77	18	78	95

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Comment: I'm sort of unclear as to what this category is? The one on the left is Non-Success, so why does this say "Successful No Progress" What is the whole "no progress" part about? I just wanted to leave a comment to make sure that it is ok.

	Success	Non Success	Successful No Progress	
MAT-53/35	901	426		1327
CL	339	69	493	408

In the department, the percentage of developmental courses taught is approximately 70%. The percentage of STEM courses is approximately 20%. The department clearly recognizes the need to serve students in developmental math courses but also desires to continue and enhance its excellent program for students majoring in mathematics, science, engineering, and other technological fields.

In the Moreno Valley Math Discipline, the WSCH/FTEF was 642.5 for fall 2008 and 716.7 for fall 2009. Overall, the math discipline is very efficient.

The Math Department is doing a very good job of serving students, the College, and the District. The department bases this judgment on the large number of students served and on the successful completion, retention, and efficiency data. As detailed throughout this self-study, the department is constantly seeking new ways to offer classes and improve student learning. The department has implemented prerequisites to enhance student success and has added courses and various modes of offering courses to better serve students' needs. During the 2011-12 year, the department will focus on student success and persistence issues.

D. Programs and Curriculum

Since the last discipline program review in 2008, the Mathematics discipline has created new courses to meet the needs of its student population. These new courses include:

Math 90 A, B, C, D, E, F – Math Modules (approved by Curriculum Committee, spring 2006)
Math 65 – Arithmetic and Pre-Algebra (approved by Curriculum Committee, spring 2006)
ILA 800 – non-credit Supervised Tutoring designed to replace Math 96-97.

As discussed in Section B, Math 90A-F is a modular system of courses comprising material from arithmetic and pre-algebra. Each module fills knowledge gaps and allows students to move through developmental material in a new format. Based on the success of students in these courses, the mathematics discipline is developing Math 91AB as a self-paced modular alternative to elementary algebra.

Math 65 is a 5-unit combination Arithmetic and Pre-Algebra course, again allowing another option for students who need to develop fundamental skills for real-life applications.
ILA 800 is a noncredit open-entry course in which a student may enroll at any time during the term. The course provides supervising tutoring, study skills development, and assistance in understanding college course assignments.

All Mathematics course outlines were revised and approved by the Curriculum Committee at its February 27, 2007 meeting. Course outlines are delineated on the Mathematics discipline website at http://academic.rcc.edu/math/. Content Review and Grids for Prerequisite Validation have

been completed. In the Curriculum Committee meeting of November 13, 2007, Math 62 A, B, C – Mathematics in the Workplace were eliminated from the Mathematics curriculum.

The Mathematics discipline provides course sequences to meet the needs of developmental mathematics students (Arithmetic – Pre-algebra – Elementary Algebra – Intermediate Algebra). The discipline provides courses for non-science major transfer students (Statistics, College Algebra, Finite Mathematics, and A Survey of Mathematics). The discipline also provides courses for students planning to transfer with a major in mathematics, sciences or engineering (Trigonometry, Pre-Calculus, Calculus I, II, and III, Differential Equations, and Linear Algebra). The discipline utilizes modules for Workforce Preparation students. Elementary Arithmetic serves the needs of students planning to enter the Nursing program.

Through the use of computerized placement test and multiple measures, prerequisites and mandatory placement have been implemented for most courses in the Mathematics discipline. The spring 2006 Curriculum Committee meeting, Math 63 – Arithmetic was approved as a prerequisite for Math 64 – Pre-algebra and Math 64 – Pre-algebra was approved as prerequisite for Math 52 – Elementary Algebra. In cooperation with the Office of Matriculation and the Office of Institutional Research, course placements are validated on a biennial cycle.

Beginning in fall 2009, Intermediate Algebra or a course with the same prerequisites became a requirement for an Associate of Arts Degree.

E. Student Outcomes Assessment

The task of assessing course level student learning outcomes is often difficult in the math discipline since there are seventeen different sections of math that are offered every academic year. However, math faculty, both full and part-time, have been very active in supporting the concept of assessment for improving instruction by completing assessment projects focusing on one of the SLOs from the course outline of record.

At the time of writing this document, an assessment cycle has been completed for the following courses:

Course	SLO Assessed	Completed cycle
Math 63	Apply the fundamental laws of arithmetic on whole numbers, fractions, mixed numbers, and decimals, solve applications and real world problem using whole numbers, fractions, mixed numbers, ratios and proportions, and decimals.	Spring 2011
Math 90ABC	Add, subtract, multiply and divide whole numbers. Add, subtract, multiply and divide fractions. Add, subtract, multiply and divide decimals.	Spring 2011

Math 64	Students will be able to apply the four basic operations to integers and rational numbers: subtracting fractions. In class intervention, reassessment	Spring 2011
Math 90 DEF	Solve equations involving integers. Evaluate real number expressions using the order of operations. Add, subtract and multiply polynomials.	Spring 2011
Math 52	All SLOs assessed through common final exam in fall 2010. Item analysis showed fractions a problem. Addressed in spring with DLAs related to fractions. Common final will again be applied in spring, analyzing those who did DLAs	Spring 2011
Math 35	Students will be able to solve linear, rational, quadratic, exponential, radical, logarithmic, absolute value equations, and systems of equations: solving quadratic equations by completing the square. In class intervention, reassessment	Fall 2010
Math 35	Solve linear, rational, quadratic, exponential, radical, logarithmic, absolute value equations, and systems of equations: solving rational equations. In class intervention, reassessment.	Spring 2011
Math 53	Compose proof though the integrations of definitions, axioms and theorems. In class interventions, reassessment.	Spring 2011
Math 11	Apply exponential and logarithmic functions in business and humanities: compound interest problems. In class intervention, reassessment.	Winter 2011
Math 12	Determine confidence interval estimates for population means, proportions and variances. In class intervention, reassessment.	Spring 2011
Math 10	Solve polynomial, radical, exponential, logarithmic, trigonometric, parametric and absolute value equations**.** Students will be able to demonstrate knowledge of basic facts about partial fraction decomposition. In class intervention, reassessment.	Spring 2011
Math 1A	Solve related rates problem. In class intervention, reassessment.	Fall 2011
Math 1B	Solve applications of integration problems, including those involving area, volume, work, arc length, and force. In class intervention.	Spring 2011

Math 1C	Write Cartesian equations in spherical and cylindrical coordinates. In class intervention, reassessment.	Fall 2010
Math 2	Find power series solutions to differential equations about ordinary and singular points. In class intervention, reassessment.	Spring 2011
Math 3	Calculate and apply determinants to a variety of problems including but not limited to areas, volumes, and cross products. In class intervention, reassessment.	Spring 2011
ILA 800 - Math	Surveys were created and administered during the spring 2011 semester. Results will be tabulated and evaluated for improvements to be made in the math lab.	Spring 2011

The assessment projects for all the courses offered by the Math Discipline at Moreno Valley College have been completed (except Math 32, cross-listed with Philosophy 32), and are available online at www.mvcsp.com/loa

F. Collaboration with other Units

The Mathematics discipline is very involved in collaborative projects with other units. As mentioned earlier in this report, the Mathematics discipline continues to work closely with the Office of Matriculation and Early Alert and placement validation. The Mathematics discipline collaborates with the Title V/CAP program on the staffing on supplemental instruction, learning communities, summer bridge, and blocked courses. The following projects/activities have involved collaboration with other disciplines:

1) Study Skills Workshops – Counseling,
2) Logic Course – Philosophy,
3) Project-based learning – History,
4) Math 63 paired with Reading course,
5) Math 35 – Chem 1A linked course,
6) Charter High Schools – Gateway to College and NuView Bridge,
7) John F. Kennedy Middle College High School articulation agreement,
8) ILA 800 – Supervised Tutoring.

The benefit of offering the classes, Math 35 – Chem 1A, in tandem has been reaffirmed by our students and upheld by their success. But, due to the present economic times and budget reductions along with the desire to better serve our Moreno Valley College students, the decision has been made not to offer the linked classes in the near future.

G. Outreach

The Mathematics discipline member participates in Jump Start program. This is a 6-week summer program and the aim of the program is to help recent high school graduates to prepare for the placement exam and college level classes. This program offers a fast-paced review of basic skills in writing, reading, and mathematics.

The Mathematics discipline also supports two Early College High School programs involving high school students taking classes on our college. One of them is the Middle College High School Program (MCHS) which is developed and implemented jointly by Moreno Valley Unified School District, Val Verde Unified School District and our college. The aim of this program is to help high school students who have the academic potential to succeed in post-secondary education, but were either likely to drop out of high school or unlikely to go to college. Students enrolled in the MCHS program take a combination of high school and college classes held on our college. The other is the Nuview Bridge Early College High School (NBECHS) program which is a partnership between Nuview Union School District, California School for Arts and our college. NBECHS incorporate college courses into its curriculum to prepare students for success in college and high-skill careers. The mathematics discipline members serve many of these high school students in our math classes. We provide information on students' learning and recommendation for improvement via progress reports to their counselors who in turn help the students to address their needs.

In the area of full time community college mathematics faculty recruitment and preparation, the discipline is involved in the Faculty Internship Program. Our discipline members serve as mentors to part-time teachers and help them to become familiar with all aspects of duties and responsibilities of a full time faculty. We also collaborate with them on departmental projects and help them to prepare for their full time job application process. Our mentees have an 80% success rate in obtaining full time tenure track Mathematics positions.

H. Long Term Major Resource Planning

The most pressing needs for the math discipline are additional full-time faculty and the development of a Math Learning Center. In Fall 2009, only 38% of our total mathematics classes were taught by full-time faculty with reassigned time at 1.1 ftes. In Spring 2010, 45% of our total mathematics classes were taught by full-time faculty with reassigned time at 1.1 ftes. In Fall 2010, 37% of our total mathematics classes were taught by full-time faculty with reassigned time at 1.1 ftes. In Spring 2011, 37% of our total mathematics classes were taught by full-time faculty with reassigned time at 1.3 ftes. In the Fall 2011, our full-time faculty will have 1.6 ftes in reassigned time. The percentage of courses taught by full-time faculty is unacceptably low when compared to other colleges and to the 75-25 goal.

The Math Lab we currently have is not suitable for proper tutoring sessions as well as serving as an online and hybrid testing environment. The ILA 800 tutoring sessions are not serving enough students and our appointment slots are always filled to capacity. A majority of the students need more than three-30 minutes sessions per week in order to fully answer questions they may have. A math learning center is what we need where the students can drop in without appointments and

ask questions they may be having with homework or they can work collaboratively together in study sessions.

The Math Lab at Moreno Valley College has been operating understaffed and under-funded for the past few years while it's services have grown immensely as well as the size of the student population that it serves. This year the real budget shortage for the Math Lab is $27,000. With the help of Basic Skills funding we barely covered our budget needs. We cannot depend on Basic Skills funding any longer. The financial analysis of the operations will show that the Math Lab more than pays for itself, even with the proposed increase in budget and staff.

Bigger Math Lab

The Math Lab has only 25 computers and three tables for tutoring. Students who use the computers need a separate area, especially those taking tests, but they are often distracted by the noise from tutoring. It would be beneficial for the students if the computer users had a separate area to work. Since the opening of the Math Lab Moreno Valley Community College has experienced significant growth in student enrollment, yet the lab space has remained the same.

More Tutors

Currently the Math Lab schedules one instructor and two tutors between 10:00 am and 4:00 pm, and one instructor and one tutor for the rest of the Math lab hours. The Math lab hours are 8:00 am - 9:00pm Monday through Thursday and 9:00am - 3:00pm on Friday. We have --- hybrid classes and 4 online classes

Current Issues

The Math Lab has two current problems that we hope to somehow resolve in the near future. We have rules that we wish for all tutors and instructors to adhere to while working in the math lab. We would be able to resolve this issue by offering a mandatory training for the instructors and tutors. Secondly, we need to have a regulation for the students who reserve a tutoring session but fail to show up. We plan to discuss this issue in the future.

Below is a breakdown of the Math Lab hours and cost to pay tutors:

Monday - Thursday 13 hours per day (hpd) x 4=52 hours + 6 hours for Friday = 58 hours

Monday - Friday 5 (hpd) x 4 =20 hours

Total - 78 hours

Total hours for 16 weeks: 78 hours x 16 weeks = 1,248 hours

Total cost for 16 weeks: $10/hr x 1,248 = $12,480

Total money needed for the academic school year**:** $24,960

I. Summary

The mathematics discipline would like to better serve basic skills and degree-seeking students at Moreno Valley College. We will use our results from our assessment projects and common final exams to evaluate our teaching methodologies and improve our instructional skills. We will maintain our high success rate in transfer students to 4 year institutions.

With the use of the annual report, the program review process can be improved by focusing the comprehensive report more closely on curriculum and assessment.

1) Maintain cohesion of curriculum; including proctored exam for online courses.
2) Explore creative ways to offer instruction in courses
3) Improve instruction in developmental courses
4) Continue with increased participation work on modules
5) Expand delivery modes

Maintain Cohesion of curriculum
Continuous efforts have maintained the curriculum.

Explore creative ways to offer instruction
The discipline continues to implement the use of technology into the classroom.

Improve instruction in developmental courses
With a Study Skills initiative grant, greater attention and focus has been given to improving instruction in developmental courses. Regularly held Study Skills committee meetings brings faculty together focusing on goals to improve student success in developmental courses.

Continue with increased participation work on modules
The discipline designed six modular courses: Math 90ABCDEF. The modules are composed of material from the first two developmental courses (Arithmetic and Pre-Algebra). The modular courses fill in knowledge gaps for students who plan to take higher-level math courses. The modular format allows students to progress at their own rate, increasing student engagement, retention, and supporting a higher success rate. Each module can be taken as a short lecture course.

Expansion of Delivery modes
In 2007 through 2010, the discipline focused its efforts on expansion of delivery modes. The discipline had the following distribution of offerings:

Year	Traditional	Web-enhanced	Online	Hybrid	Modules
2007	110	10	5	2	0
2008	110	14	7	2	21
2009	101	17	8	2	18
2010	95	3	10	17	15

A number of issues related to delivery modes are:

1) The table above clearly illustrates the growth of sections offered in modalities utilizing technology. The growth of online, web-enhanced, and hybrid class sections has enhanced access for students, since section growth is not as hindered by the availability of classrooms. The expansion of modalities allows increased options for students and faculty. The web-enhanced courses before Fall 2010 were "redesign" which required students to have "seat-time" in a math lab setting but with reduced classroom time. From Fall 2010 to current, in order to better serve our students, we have decided to change all redesign courses to a hybrid format which eliminates the mandatory math lab seat time.

2) With the increase in online offerings there has become a concern over testing procedures. In a traditional course where testing is done in the classroom, an instructor decides and monitors whether calculators, notes, books, and assistance of any type should, or should not, be used during testing. In a purely online environment, there is no oversight to the use of these study aids during testing. The discipline decided to require proctored testing utilizing for online courses. Currently, online testing is held in the math lab.

3) Recently, the discipline approved a pilot for a new online course in statistics. Research and preparation for this new course are under way.

4) Hybrid course offerings: In the Fall 2004, a hybrid Intermediate Algebra course piloted. Currently there are now 6 sections offered. Hybrid courses were soon offered in elementary algebra, and college algebra.

5) Several approaches to creating meaningful learning in the online courses were piloted during the spring and fall 2010. These include the following:

a) Directed learning activities (DLA) in several Math 52 online courses were assigned throughout the semester in order to promote synchronous learning activities which encouraged students to apply newly learned material in real time.

b) Online Math Lab: Students could utilize on online math lab with real time tutors using an online platform created by a joint effort of CCCConfer and "Elluminate". After observing data from Course Compass showing when the majority of students studied online, it was determined that online tutoring hours would serve more students during evening hours. In the spring 2010, two tutors were scheduled for four evening hours each week. In the fall 2010, three tutors were scheduled for six evening hours each week. During the spring 2011 semester, it was decided to abandon the online math lab, since data from the two previous semesters showed only a small number of students utilized the online lab. When the Moreno Valley College increases its online offerings, reinstalling the online math lab may provide a beneficial service to students.

J.Recommendations to the Program Review Committee

(none at this time)