

2004 Developmental Math Program Report

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Introduction

The annual report for developmental mathematics is a forum for presenting program news and updates as well as distributing information related to the program assessment plan. I issue this report in conjunction with the Developmental Math Workshop held each January at UW Fox Valley.

The reader should refer to the following documents for additional background information: *Developmental Math Programs at the UW Colleges* (1/3/2000), *The Status of Developmental Mathematics in the UW Colleges* (1/12/2000), and *Developmental Math Program Recommendations* (2/28/2000). All three of these reports along with the previous annual reports (2000, 2001, 2002 and 2003) are available on the Developmental Math web site at <http://rock.uwc.edu/facultypages/galexand/devmath/devmath.htm>. Please note that the URL for this site has changed.

Throughout this document, I will make reference to courses by course numbers. The developmental math courses include MAT 08x *Topics in Geometry* (includes MAT 081, MAT 085 and MAT 087), MAT 090 *Basic Mathematics*, and MAT 09x *Elementary Algebra* (includes MAT 091, MAT 095 and MAT 097). MAT 105 *Intermediate Algebra* is the first course in the degree credit math sequence, which is typically followed by either MAT 108 *Quantitative Reasoning* or MAT 110 *College Algebra*. All developmental math course guidelines can also be found on the Developmental Math web site listed above.

Complete math department course offerings and descriptions are available in the catalog of the UW Colleges (<http://www.uwc.edu/academics/catalog.asp>).

Program News and Updates

Two new staff members joined our developmental math program in Spring 2003. We welcome John Morris (Fond du Lac, 091) and Geraldine Hammer (Marathon & Fox Valley, 090 and 091) to our teaching corps.

The Fall 2003 semester saw more changes this year. Some of these people have taught other math courses in the UW Colleges, but new instructors in developmental math include Frances Borman (Baraboo, 091), Edward Clemons (Fox Valley, 091 and developmental skills specialist), Jeanne Eschle (Waukesha, 095), Joseph Estermann (Marathon, 090), Roger Payne (Waukesha, 091), Bruce Schoenberger (Waukesha, 095), Jeffrey Strick (Marathon, 091),

Dee Ann Dewitt transferred positions from Marshfield to Fox Valley and is teaching MAT 090 and some degree credit math. Barb Bendlin stayed at Rock County, but is now director of the Learning Resource Center, tutoring math and teaching MAT 091 and other math courses. Brad Weiss became the new math specialist for TRIO at Rock County.

The online course for MAT 081 was developed by Cheri Conover (Fox Valley) over the summer and made its initial run with 13 students in the Fall 2003 semester. This course is expected to be offered online both fall and spring semesters, in addition to the compressed video course in the spring semester.

MAT 090 sections were taught at eight campuses this last fall semester, with new sections added at Baraboo. Enrollment in MAT 090 was 276 students, up 10% from Fall 2002. This growth trend reflects our increasing support for students in the lowest math placement category. Previously, these students would have been forced to begin in MAT 091 and likely faced more difficulty in successfully completing their developmental math needs.

The Online MAT 09x Learning Lab that was developed in the Blackboard course management system was taken offline after the UW Colleges dropped the license to use tutorial modules at uwc.academic.com. Our students no longer have free access to these modules. The cost was high for the usage statistics and number of students served. One bonus from the online learning lab was a high participation rate from MAT 09x students in the Spring 2003 assessment exercise. The Online MAT 09x Learning Lab was unavailable in Fall 2003, but will be up and running again in Spring 2004 with in-house materials. Any developmental math instructors would like to share handouts, exercises, or other course materials with MAT 09x students across the UW Colleges should send items to George Alexander for inclusion. Any format (even hard copy) is acceptable.

Enrollment Information

In the Fall semester 2003-04, we had 1502 students in 66 sections of developmental math, a headcount increase of 10.8% over last fall. Developmental math students accounted for 21.6% of total mathematics students. Degree credit math enrollment was 5436 students, up 2.1% from last fall. Total math enrollment was 6938 students (a 3.9% increase).

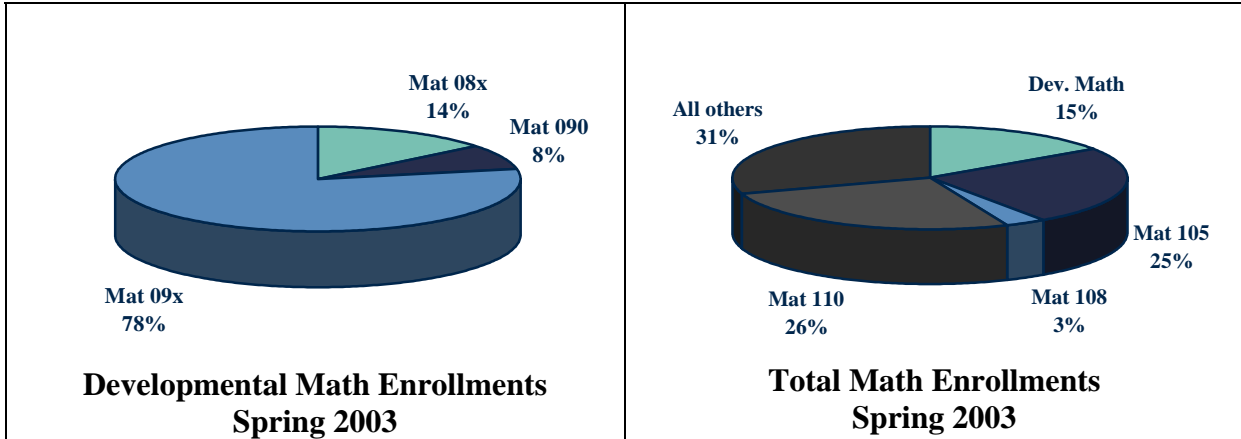
Fall Semester 2003-2004				
Course	Sections	Campuses	Enrollment	Mean Class Size
MAT 081	6	5 + online	77	12.8
MAT 085	0	0	0	
MAT 090	13	8	276	21.2
MAT 091	36	13 + online	871	24.2
MAT 095	9	1	247	27.4
MAT 097	2	2	31	15.5
TOTALS	66	13	1502	22.8

**Developmental Math Enrollments
Fall 2003**

**Total Math Enrollments
Fall 2003**

In the spring semester 2002-03, we had 882 students in 43 sections of developmental math, a headcount increase of 27.6% over last spring. Developmental math students accounted for 15.7% of total mathematics students. Degree credit math enrollment was 4744 students, down 1.5% from last spring. Total math enrollment was 5626 students (a 3.4% increase).

Spring Semester 2001-2002				
Course	Sections	Campuses	Enrollment	Mean Class Size
MAT 081	7	6	122	17.4
MAT 085	0	0	0	
MAT 090	6	3	69	11.5
MAT 091	24	12	555	23.1
MAT 095	4	1	109	27.3
MAT 097	2	2	27	13.5
TOTALS	43	13	882	20.5



Developmental Math Student Demographics

Academic Year	2002-03	2001-02	2000-01	1999-00	1998-99	1997-98	1996-97
Total number	1925	1618	1505	1362	1252	1179	1082
Male	38%	40%	40%	38%			
Female	62%	60%	60%	62%			
MAT 08x	8%	11%	14%	16%	18%	17%	20%
MAT 090	15%	11%	13%	15%	10%	8%	9%
MAT 09x	77%	78%	73%	69%	72%	75%	72%
Asian	0.8%	1.5%	0.6%	0.5%	0.9%	1.0%	0.5%
Black	1.7%	2.6%	1.9%	1.4%	1.1%	1.9%	1.3%
White	90.2%	87.9%	91.9%	93.6%	94.7%	93.2%	94.4%
Unknown	0.2%	0.8%	0.2%	0.1%	0.1%	0.0%	0.1%
Hispanic	3.1%	3.1%	3.1%	1.8%	1.6%	2.1%	1.6%
SE Asian	2.3%	2.3%	1.5%	1.9%	0.7%	0.5%	1.3%
Native American	1.6%	1.5%	0.9%	0.8%	0.8%	1.3%	0.8%
Traditional Age	77%	73%	79%	75%	76%	73%	72%
Nontraditional (25+)	23%	27%	21%	25%	24%	27%	28%

The overall demographics of our developmental math students remain relatively consistent with the populations of previous years. The male to female ratio remains about 2 to 3. The proportions in the different developmental math courses are showing some shift towards a higher rate in MAT 09x. The trend for decreasing need for MAT 08x continues. We have developed distance education courses (compressed video each spring and online both semesters) to help meet the enrollment needs where a campus course is not feasible.

We also saw a significant expansion in the number of campuses and sections for MAT 090, especially in the fall semester. In part, this reflects efforts to expand campus offerings to serve students entering with the lowest tier of math placement scores. This is

consistent with program recommendations and shows campus commitment to improving the success of our developmental math program.

Program Assessment 2002-2003

In 1999, I proposed a Developmental Math Program Assessment plan to the department. The intent is to use the five criteria to evaluate overall program effectiveness in quantifiable terms. For each criterion, I will give a description of how progress towards the goal was measured and a report on the results from recent years. Further background information from the academic years 1996 to 1999 is available for comparison in *The Status of Developmental Mathematics in the UW Colleges* (1/12/2000).

- 1. Students will be successful in developmental math courses.** For the developmental math courses, "success" is defined as earning a grade of C or better in the course. For each course, I computed the course success rate based on the number of students earning a passing grade (C or better) compared to the total number of students enrolled in the course. The 10-day enrollment figures are used for the total, so any drops within the initial add/drop period are not included. Audited course enrollments are also excluded. Figures from the five previous years are given for comparison.

The success rates for MAT 090 seem to be holding pretty steady over the past few years. This is a good sign that the expansion of MAT 090 program offerings has been consistent with our early efforts, despite some significant increases in enrollments, sections, and campuses.

MAT 090 success rates by semester for each academic year					
	1998-99	1999-00	2000-01	2001-02	2002-03
Fall	79.1%	72.2%	78.2%	77.3%	78.5%
Spring	77.5%	75.0%	80.6%	65.4%	66.7%
Summer	80.0%	86.7%	90.0%	72.7%	84.0%
Total	78.8%	74.1%	79.1%	75.7%	76.6%
Ave. grade	2.59	2.48	2.57	2.62	2.47

MAT 08x success rates for the fall semester 2002-03 show a steep drop from recent gains. Although the success rates in spring and summer held steady, the overall rate for the year fell below recent expectations. Curiously, fall semester success rates are significantly and consistently lower for the MAT 08x course. Note that the reverse pattern seems to hold for MAT 09x (lower success rates in the spring). Many students are taking both MAT 08x and 09x during the academic year. We may simply be seeing that each course helps students in the other, so that skills are better by the time the student takes a second developmental math class.

MAT 08x success rates by semester for each academic year					
	1998-99	1999-00	2000-01	2001-02	2002-03
Fall	59.5%	49.1%	60.0%	66.7%	57.7%
Spring	76.3%	67.9%	81.1%	72.5%	71.1%
Summer	33.9%	61.5%	84.2%	85.7%	87.5%
Total	67.9%	57.5%	73.4%	72.5%	68.2%
Ave. grade	2.32	2.03	2.37	2.42	2.34

The success rates for MAT 091 and 095 continue to look very steady, even somewhat stronger for 2002-03. Though lower than other developmental math courses, these success rates are consistent with rates in intermediate and college algebra courses. The stronger expectations seem to be a factor in determining student success in the later courses of the algebra sequence.

MAT 091 and MAT 095 success rates by semester for each academic year					
	1998-99	1999-00	2000-01	2001-02	2002-03
Fall	59.0%	60.2%	64.4%	64.6%	65.1%
Spring	62.9%	60.2%	57.1%	57.1%	60.0%
Summer	75.8%	76.7%	70.7%	69.0%	74.1%
Total	62.0%	61.6%	62.4%	62.6%	64.1%
Ave. grade	2.12	2.09	2.15	2.17	2.18

- 2. Students will move from the developmental math program to degree credit math courses.** After achieving success in meeting developmental math requirements, we expect students to move into the degree credit curriculum in math. Most often, the transition is from MAT 09x (*Elementary Algebra*) to MAT 105 (*Intermediate Algebra*). The transition rate is found by determining the portion of students who enrolled in MAT 105 within one year after passing MAT 09x (grade C or better). This transition rate takes somewhat longer to measure, since it is not just a one-semester snapshot. All in all, these MAT 09x to MAT 105 transition rates are comparable to general retention rates in the UW Colleges.

Normally, the transition rate from fall semester MAT 09x is better than the spring, since more students are likely to transfer out of the UW Colleges after the spring semester. In 2001-02, the transition rate was an identical 56% for both semesters, however. This is a decrease from recent trends in the fall semester, but normal for the spring semester. Note that success rates in the Fall 2001 semester were normal.

The summer transition rate remains high since summer session students are more likely to continue with fall semester enrollments in the new academic year.

Semester	Passed 09x	Attempted 105 (within one year)	Transition Rate
1997-98 Fall	351	229	65%
Spring	209	113	54%
Summer	98	59	60%
Total	658	439	61%
1998-99 Fall	365	249	68%
Spring	250	143	57%
Summer	75	43	57%
Total	690	435	63%
1999-00 Fall	378	251	66%
Spring	252	147	58%
Summer	69	40	58%
Total	699	438	63%
2000-01 Fall	501	340	68%
Spring	257	146	57%
Summer	70	44	63%
Total	828	530	64%
2001-02 Fall	610	343	56%
Spring	271	152	56%
Summer	77	50	65%
Total	958	545	57%

- 3. Successful developmental math students will perform at least as well as other students in MAT 105.** After the transition is made into MAT 105, we also expect that former developmental math students will be able to master the course material in the degree credit sequence. By comparing these students to the full MAT 105 population, we can determine if the developmental course is giving the student proper preparation for success in MAT 105. I used the following performance indicators in MAT 105: average number of MAT 105 attempts per student, MAT 105 success rate (a grade of C- or better), and the average grade in MAT 105.

I consider this third criterion for program success to be one of the most

important, since success in the other goals is meaningless if these students perform poorly once they get into MAT 105. The data has consistently shown, however, that the successful MAT 09x students do perform on a par (if not better than) with the general population in MAT 105. It is perhaps interesting to note that the overall success rate in MAT 105 jumped up slightly for the last two academic years, with the gain even more obvious for the former developmental math students.

Although not shown in this table, there is also a strong correlation between grade earned in MAT 09x and success in MAT 105. Students who earn A or B grades in MAT 09x can truly expect success in MAT 105. A grade of C in MAT 09x is likely an indicator that MAT 105 will also be difficult for the student to master.

This information on the comparisons of MAT 105 students is especially valuable for encouraging developmental math students that they can achieve success. It also shows us that the time spent in the Elementary Algebra course is well worth the effort since it prepares these students for success in a course they were not ready for at first.

Academic Year	1999-2000		2000-2001		2001-2002		2002-03	
	All 105	09x Success	All 105	09x Success	All 105	09x Success	All 105	09x Success
No. of MAT 105 students	2283	538	2441	595	2795	731	2582	791
No. of MAT 105 attempts	2452	567	2591	629	2993	791	2759	835
Average no. of attempts	1.07	1.05	1.06	1.06	1.07	1.08	1.07	1.06
No. of course successes	1560	389	1633	400	1969	566	1851	632
MAT 105 success rate	63.6%	68.6%	63.0%	63.6%	65.8%	71.6%	67.1%	75.7%
Average MAT 105 grade	1.97	2.16	1.98	2.02	2.04	2.17	2.10	2.27
Cumulative GPA	2.27	2.52	2.32	2.50	2.32	2.52	2.38	2.58

4. Successful developmental math students will become better prepared for college credit courses than other students.

The final row in the above table shows the cumulative grade point averages for MAT 105 students. The cumulative GPA for students who first passed MAT 09x continues to run significantly higher than that for the general MAT 105 population in each year. Note that developmental courses are not counted in grade point averages, so the cumulative GPA is a good indicator of student success in the degree curriculum.

5. Developmental math students will achieve designated course proficiencies.

This goal will be measured through the MAT 091 Assessment plan, which began in the Spring 2001 semester. In the Spring 2003 semester, a total of 312 students participated in the assessment process. This includes 146 students who took the assessment test online and 166 students who were assessed via final exam questions in class. This was the first semester that the online version of the assessment test was available. These assessment figures represent 46% of the total MAT 09x enrollment, well above previous participation rates.

In the Fall 2003 semester, we had 12 participating instructors covering 236 students. Due to the loss of our Blackboard site for the MAT 09x Online Learning Lab, the online version of the assessment was not available, but participation rates (16% of enrollment) were still fairly good compared to previous semesters. By the end of the Spring 2004 semester, we should have the assessment available again in the new online learning lab site.

We now have six semesters (three academic years) worth of initial assessment data, so we should have a general feeling for base expectations now. The Developmental Math Workshop in January 2004 will focus on analyzing the assessment data that we have collected so far. We plan to set some priorities for areas of improvement, review the assessment plan and question pool, and develop new plans for assessment of goals in MAT 08x and MAT 090.

Proficiency goals were assessed on the basis of final exam questions drawn from the assessment question pool for MAT 09x. Instructors selected either specific questions or question types to include on the final exam and rated individual student performance as follows:

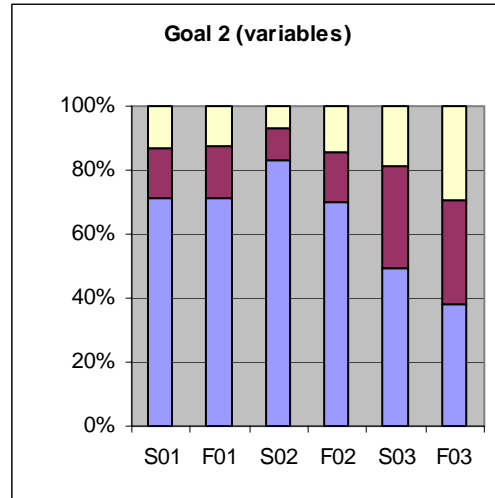
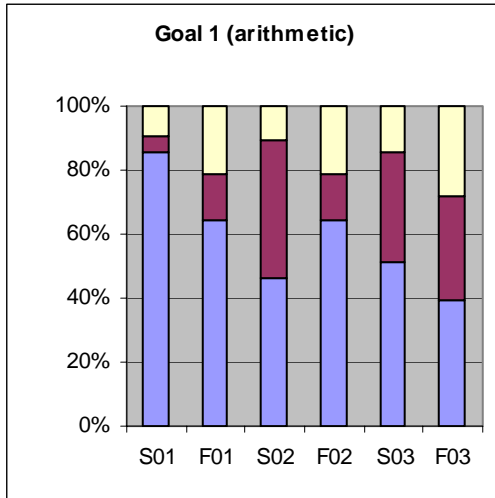
- Scores of 90% to 100% exceeded expectations;
- Scores of 70% and above met expectations;
- Scores below 70% failed to meet expectations.

Totals are reported in the following table for each of the seven outcome goals established in the course guideline for MAT 09x. Namely, the successful student will:

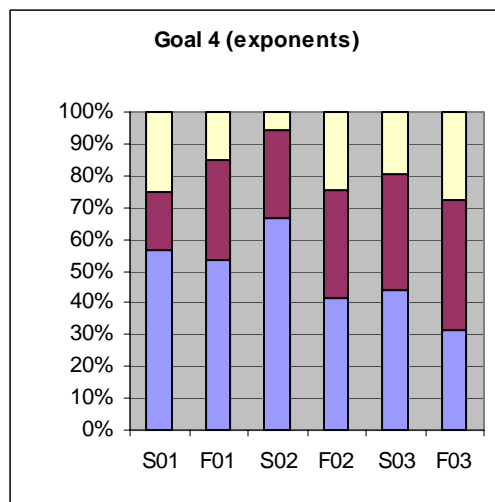
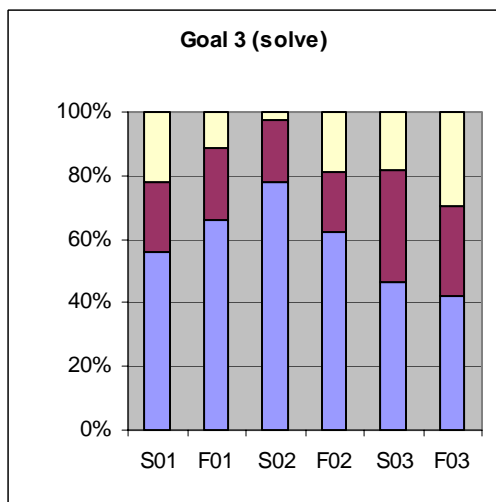
1. be able to perform arithmetic calculations on real numbers and understand the order of operations.
2. use variable notation and be able to simplify and evaluate algebraic expressions.
3. be able to solve linear equations in one variable.

4. know the rules of exponents as applied to variable terms.
5. be able to add, subtract, and multiply polynomials.
6. know how to factor polynomials using greatest common factoring, the grouping method, trinomial factoring, and difference of perfect squares
7. be able to graph linear equations with two variables in the rectangular coordinate system.

Failed to meet expectations
 Met expectations
 Exceeded expectations



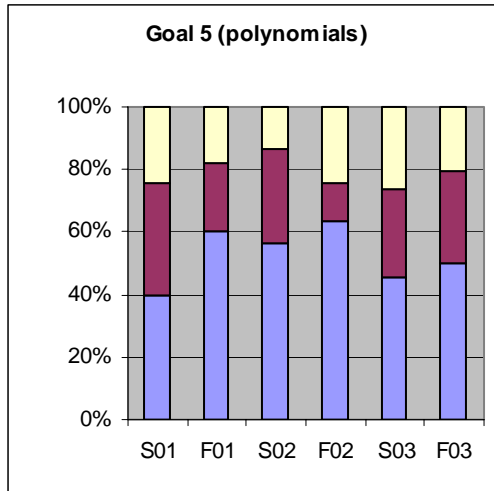
Goals 1 and 2 usually test at a pretty high level for students meeting or exceeding expectations. It appears that we have been more consistent with goal 2, but the decreasing trend for meeting expectations is a concern. The spring 2002 scores are high in all goals, but relatively few students were assessed that semester.



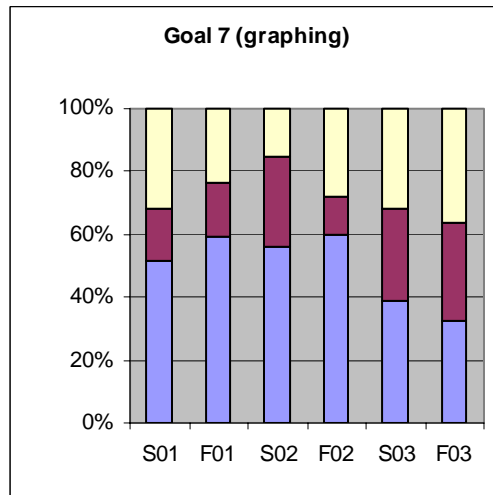
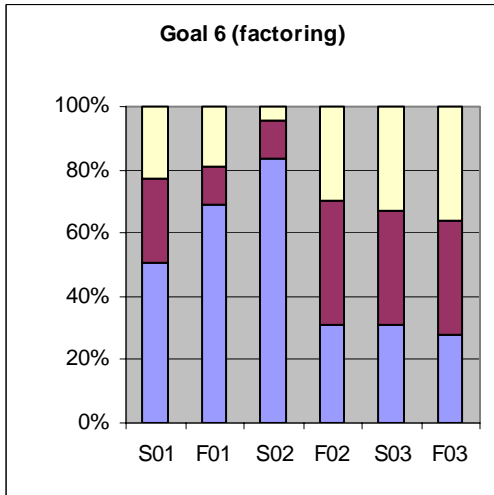
Goals 3 and 4 also appear satisfactory (at least 75% of students meet or exceed expectations). There may be room for improvement in regards to the

teaching of exponent use and rules since the portion of students exceeding expectations is lower than for other goal areas.

We have had a high level of success with goal 5 and even apparent improvement over the last four semesters. Goal 5 is the only one to receive higher assessment rates in the Fall 2003 semester as compared to prior semesters.



Performance on Goal 6 is less consistent and goal 7 definitely needs some improvement. Student performance on goal 7 (graphing) continues to lag below that for other goals. These are the two goal areas that have assessment rates below 70% for meeting or exceeding expectations. It is clear that factoring and graphing skills are essential in later algebra courses, so we should work on finding ways to improve student achievement in these topic areas.



Program Configurations by Campus

Campus	Current Course Offerings			T R I O	Math Lab	*Prof. tutors	Peer tutors	Other notes
	Fall	Spring	Summer					
BRB	090 091	091		X	X	X		
BRN	090 091	081 091			X	X		
FDL	091	091	091	X	X		X	
FOX	090 091	081 090 091	081 090 091		X	X	X	4 credit 091
MAN	091	091	091		X	X	X	
MTH	090 091	090 091	090 091	X	X	X		
MNT	081 090 091	081 091			X			
MSF	090 091	090 091	091		X	X		4 credit 091
RLN	081 091	081 091	091		X	X		
RCK	081 090 091 097	081 090 091 097	081 091	X	X	X	X	2 credit 090 (integrated with 091)
SHB	081 090 091	091	091		X	X		2 credit 090
WSH	081 091	081 091			X		X	
WAK	095 097	095 097	095	X	X	X		CRLA Tutor training
Distance Ed	081 onl 091 onl	081 onl 081 cv 091 onl			Online math learning labs			

*Professional tutors include math specialists and tutor coordinators.