

## Mathematics Faculty

The earliest history of the math program is recalled from January 1973 when developmental education was offered at a learning lab on 10<sup>th</sup> St. on base, known as the Marine Corps Air-Ground Combat Center (MCAGCC). By August 1973, Col. Hal Breece USMC (retired) negotiated with Don Ackerman, the director of the High Desert Campus of College of the Desert (COD), to begin offering math classes. In August 1973 Marian Lee and Judy Havenstein were hired full-time (210 day contracts) to teach math as a pre-requisite for the Marine Corps Communications and Electronics School.

Judy Havenstein's husband was transferred in January 1974; upon her departure Clyde Fletcher was hired (full time 210 day contract) and Jeanne Cosby was hired as adjunct faculty (20 hours per week). Mr. Fletcher resigned in spring 1974 and his contract was paid out and not renewed.

Jeanne Cosby's 20 hours per week in the classroom as an adjunct necessitated hiring a second adjunct employee; thus Vera Fissette was transferred from a classified position at the base learning lab to the status of an adjunct instructor in the C & E math class.

Until retiring in June 1978 Marian Lee ran the Marine Corps Communications-Electronics School (MCCES) Math program. During her oversight of the program Marian Lee went through curriculum process to initiate Math 56 (Math for Electronics) as a 2-unit course. When Mrs. Lee retired in 1980, Ms. Fissette and Ms. Cosby ran the MCCES math program, each working 35 hours per week in the classroom.

In November 1982 after two years working of working 35 hours a week in the classroom Ms. Fissette and Ms. Cosby were offered contracts with tenure. Provost Jim Pulliam stated he could not provide full-time contracts to Ms. Fissette and Ms. Cosby in the spring of 1982, as the contracts were denied by the management at College of the Desert. Ms. Fissette and Ms. Cosby then joined CTA which led to the November 1982 contracts. The District balked at Ms. Cosby and Ms. Fissette forcing the hire, so, instead of leaving both in charge of the MCCES Math program, both instructors were reassigned. Ms. Fissette was assigned to the learning lab on base and Ms. Cosby was assigned to math, biology, anthropology and psychology classes mainside, which in 1982-1983 would have been the catholic school site in Twentynine Palms, CA.

Mr. Cliff Oney, an auto instructor from COD, was brought to the MCCES Math program (on base) in 1982 after the reassignment of Ms. Fissette and Ms. Cosby. Subsequently, in August 1983, MCCES ousted CMC instructors and began running their own math program as a pre-requisite for C & E school. Mr. Oney was given charge of the Math 57 and elementary algebra mainside. Of note, Mr. Oney sat in on classes as part of his load in order to learn how to do the math required.

Ron Green was hired in 199x, worked at CMC, and left for Silicon Valley in August 1996. Laura Graff was hired in 1998 to replace Ron Green. Laura Graff then worked at CMC for one year before leaving to COD upon the split of the two sites.

Copper Mountain Campus (CMC) functioned as a satellite campus of College of the Desert (COD) beginning with phase one in Joshua Tree, CA, in 1984.

At the point of separation from COD, full-time faculty were given the option of moving to COD; this included Laura Graff, who had taught math full-time at Copper Mountain Campus only during AY 1998-1999. Michael Chlebig, who received tenure in the CIS area in spring 1999, asked to be moved to the math area; Michael Chlebig replaced Laura Graff for AY 1999-present.

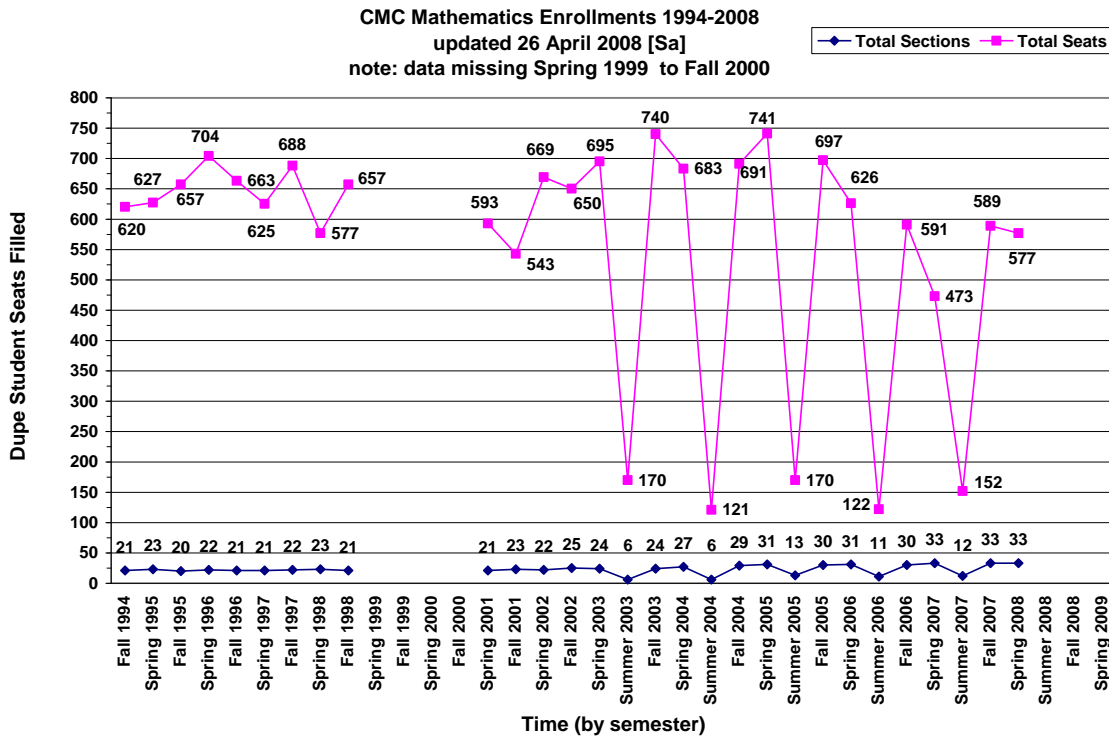
Vera Fissette retired at CMC in Aug 2002. Until the vacancy created by the retirement was filled Ms. Cosby transferred the majority of her teaching load to math from biology. In 2003 a math hiring committee screened and interviewed potential instructors and sent two names to the president for final selection of the math instructor. CMC chose NOT to hire the replacement for Ms. Fissette for fiscal reasons although the budget roll over for the year exceeded 13%.

During spring 2006, interviews were ongoing for a new math hire; Tony Thacker was hired as full-time tenure track beginning AY06-07. The responsibilities for this position are primarily in the basic skills and freshman math levels. In spring 2007, Brad Berger was hired as full-time tenure track with primary responsibilities in statistics, physics and upper level math classes. In AY 2007-2008, there are 4 full time math instructors: Michael Chlebik, Jeanne Cosby, Brad Berger and Tony Thacker.

As the following data indicate, there is a need for more full time faculty in the mathematics department. (Appendix A, Item # 32, 33) The department is offering approximately thirty sections of math each semester, with full time faculty responsible for twelve). There is a pool of approximately 15 adjunct faculty who complete the department. For spring 2008, there were 32 sections of math plus two sections of math labs. Full time faculty covered 11 math classes with Chlebik also covering one lab. Jeanne Cosby was on medical leave for spring 2008, and her three classes were taught by Len Stencil. While we feel that we have a competent adjunct faculty, there should be better coverage by full time, contracted staff.

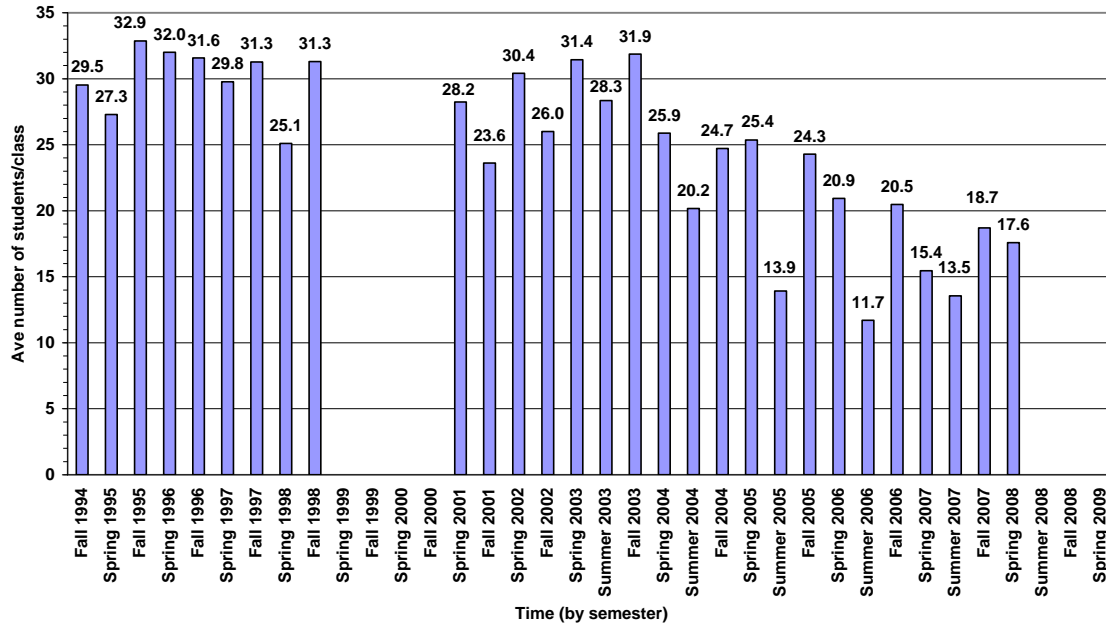
### Enrollment History

CMC total student mathematics enrollments on or near the first day of a semester, and total number of mathematics course sections offered (less lab sections and department seminars like Math 48A, B or C) are reflected in the following chart:

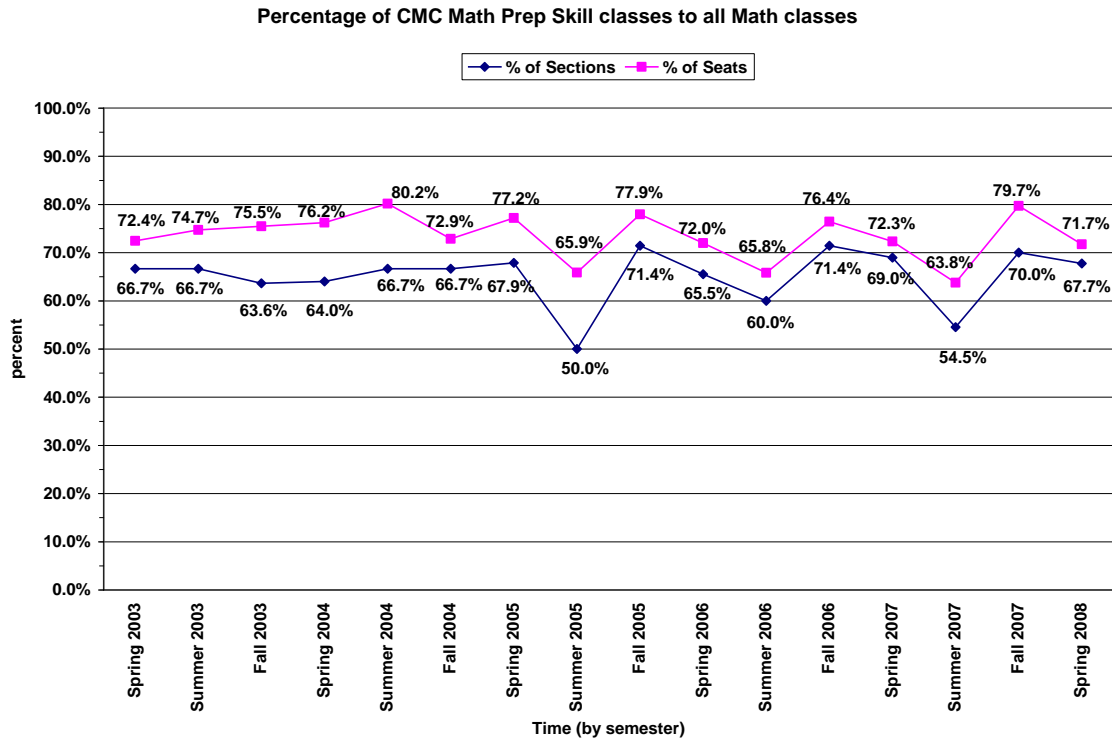


Average class sizes on or near the first day of a semester are reflected in the following chart:

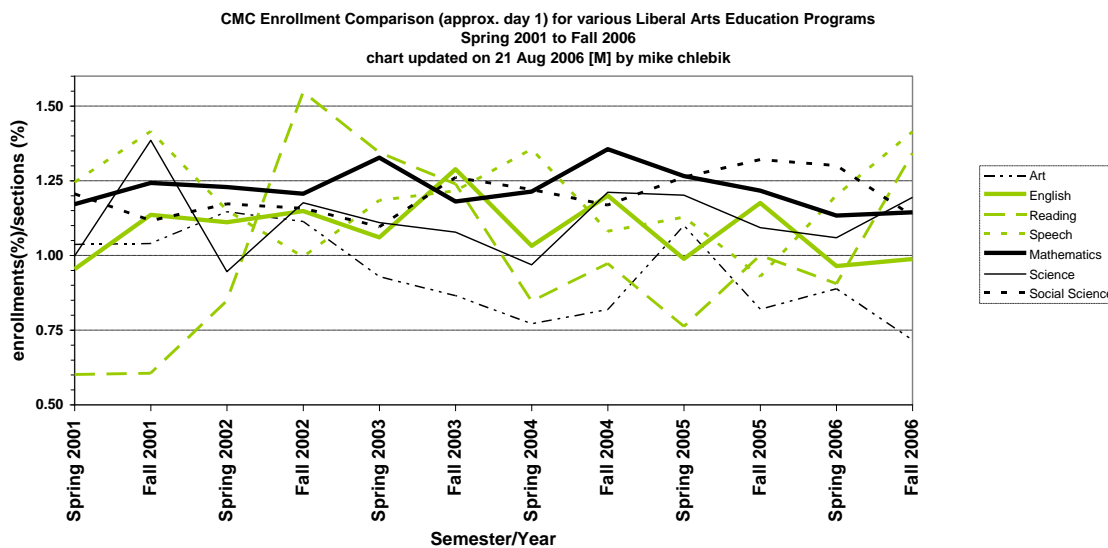
**CMC Math Class Size Averages (without math labs) 1994-2008**  
 updated 26 April 2008 [Sa]  
 note: data missing Spring 1999 to Fall 2000



A chart reflecting math basic skills classes against all math offerings is shown below. Most of the upper level math courses are singletons, offered only once per year, and many times have a lower enrollment than lower level classes. This may be the reason for the inequality in the ratios.



A chart comparing math enrollments against other liberal arts areas is below (as the ratio of enrollments to sections exceeds one, the discipline should offer more sections): The ratio for the mathematics department is currently around 1.15, which indicates that more sections are needed, but availability of qualified math instructors is an issue.



## Mathematics Curriculum Development

A special provision by the California Legislature created Copper Mountain College as an independent college in a new college district in July of 1999. This separation was affirmed by the voters of the new district in November 1999. A detailed historical review of the college is included in the 2000-2001 WASC accreditation report.

All of COD's mathematics courses were carried over to Copper Mountain College (CMC). Early in AY 1999-2000 a decision was made to not offer Math 30, Geometry, at CMC; thus this course was removed from the CMC catalogue. Additionally, Math 56, Introductory Technical Mathematics for Electronics [two lecture units], was allowed to remain in the CMC catalog but not be offered, pending creation of an electrical/electronics curriculum at CMC. CMC first offered electricity courses in AY 2005-2006, and the Math 56 course outline of record was updated to be three lecture units and the course re-titled Basic Electrical/Electronics Mathematics. Math 56 provides instruction in basic mathematical formulas and applications used in the elementary electrical/electronic fields. Math 56 offers a review of algebraic operations in mathematics necessary for continued progress in electrical/electronics courses. Additionally Math 98/Math 97, Mathematics Supplemental Lab, were approved and offered for the first time in AY 2002-2003. These labs, one or 0.5 credit units, are an open entry/open exit environment that provides opportunities to develop mathematics skills, notation, and language for students enrolled in any mathematics or physics course. Emphasis is on one-on-one tutorial help for homework, audio visual aids, or computer assisted instruction. In AY 2002 CMC

purchased 40 calculators (TI-86) for student use; these are usually issued as needed to PreCalculus and Calculus students.

The course outline of record for Math 40 Intermediate Algebra, was revised to include a lab component. The course is currently 4 credit units with weekly hours changed from four (2.5 lecture and 1.5 lab hours) to six (3 lecture/3 hours lab). Math 57 (Pre-Algebra) and Math 50 (elementary Algebra) had the same changes made in AY 2006-2008.

CMC began offering Math 40, Intermediate Algebra, on-line in spring 2005. Additional hybrid sections of Math 40 were offered for the first time in fall 2005. Additionally, Math 50, Elementary Algebra, was first offered on-line in fall 2005. Research correlating distance education teaching modality with traditional “brick and mortar” classroom teaching has not been conducted. The data available (Appendix A, items #5 and #7) show a comparison between compressed, online and traditional students success (%) and GPA. Further study is needed to track students from online/hybrid courses to subsequent traditional classes.

During AY 2006-2007, the course outlines of record were updated for Math 57, Math 50 and Math 40. These changes took effect fall 2007 (57 and 50) and spring 2008 (Math 40).

- The course title of Math 57 was changed from College Arithmetic to Pre-Algebra. In the old curriculum, the basic concepts of algebra (integers and equations), were not covered until the end of the text. Many of these students had no background in algebra and it was felt that a pre-algebra course might better prepare them for Math 50, Elementary Algebra. A new text was chosen that integrated basic algebraic concepts with the arithmetic skills appropriate for that level. Further discussion among the faculty is needed regarding the use of calculators in this course.
- A new text was chosen for Math 50 (Elementary Algebra) and Math 40 (Intermediate Algebra). While the concepts did not change, the format of the text should be better for the introductory student. Further research is needed to follow success rates.
- During AY 2007-2008, the course outlines of record were updated for all other math and physics courses. These changes will take effect during fall 2008 and spring 2009.
- A new text was chosen for Math 10 (College Algebra). The new text integrates more graphing and functions than was in the old text.
- In the fall of 2007, instructors of math 57 were asked to submit a roster listing their chapter 1 (whole numbers) test scores and the corresponding student course average. (Appendix B, item # 30) Further tracking is necessary, but it seems that failure on the chapter one test is an indicator of failure or withdrawal from this course.
  - Discussion is needed within the department regarding a CMC chapter 1 test that would be used to advise students regarding their success in Math 57. An alternative parachute course would need to be added to the schedule (possibly DE 330 – math skills).
  - Inspection of the math 57 COR indicates a short list of entrance skills – none addressing mathematics. Using the DE 330 (Algebra) course objectives as Math 57 entrance skills would allow us to better advise students.
  - Current Math 57 Entrance Skills
    - Identify transitions and relationships between ideas, including addition of ideas, relationships involving time, comparison and contrast, and cause and effect.
    - Use basic study-skill techniques.
    - Demonstrate 8.5 grade-level vocabulary proficiency.

- Read at 8.5 grade-level with 80% comprehension.
- DE 330 Course Objectives:
  - Understand whole numbers, identify their place value, and round off.
  - Compute addition, subtraction, multiplication, and division problems.
  - Grasp word-problem-solving strategies and solve.
  - Solve addition, subtraction, multiplication and division of fractions.
  - Compare and convert fractions to decimals.
  - Compute addition, subtraction, multiplication, and division decimal problems.
  - Understand the relationship between fractions, decimals and percents; solve for percentages.

The faculty has begun preliminary work on developing college core competencies and course student learning outcomes (SLOs). A rough draft of the core competencies was developed in Fall 2007, and these are being used as a framework for developing student learning outcomes. Student Learning Outcome statements have been developed for the math classes in Developmental Education (DE 300A, DE 330, DE 332, and DE 334) and in basic skills mathematics (Math 57, Math 50 and Math 40) and freshman level mathematics (Math 10 and 13) (Appendix C). These need to be reviewed each semester for a continuous improvement of the mathematics curriculum.



## **External recommendations:**

### Basic Skills Initiative Committee

Based on a self study led by Sheri Holbrook, Title V grant coordinator, recommendations were made by the committee to address the basic skills student (Appendix D). The recommendations address the need to coordinate teaching strategies within the math department and across disciplines, to implement effective teaching strategies in all classes, and recruit more faculty members whose focus will be the basic skills student.

### Basic Skills Resource Team report

This study was undertaken as an external review of the basic skills program at CMC. Merrill Deming (Crafton Hills College), Katheryn Garlow (Palomar College), Laura Hope (Chaffey College) and Wayne P. Hubert (Chaffey College) visited the campus and interviewed staff, faculty and students.

Their recommendations go beyond the mathematics department; Organizational structure, curriculum, instruction, student services, academic support services were also studied. (Copper Mountain College, Resource Team Report on Basic Skills, March 2008, page 37). Mathematics instructors at CMC should review this document as they review the program. There are recommendations relating to classroom instruction and suggestions for questions that should be part of our research.

**Steps in review process**

- History prior to 2007 was written by Chlebik.
- A program review was completed in fall 2005 and reported to the CMCF BOT in spring 2006 by Dr. McGinness.
- A review of the program has not been completed since leaving COD in 1999. Past management has not made data available for such a review. No math department information regarding enrollment, retention, grades, survey results, etc. have been available to full time faculty until Fall 2007, when the current management began releasing requested information.
- All full time faculty were asked to participate in a program review to be completed by December 2008. In May, the division chair, Bruce Bridenbecker, asked Tony Thacker to lead the review for the mathematics program. Thacker reviewed all documents, completed a draft in June 2008, and this was made available to other full time faculty for editing.
- Department meetings with Berger and Thacker was held to review document draft. These meetings were in August and September and will continue until the document is forwarded to the department chair.
- Advisory Committee meeting is planned for October 2008.

**Current Status: Goals, Measures of Success & Outcomes**

**Instructions:**

Goals: State the goal and give a brief description of its origin; cite Core Competency

Measure: Briefly describe the measure(s) used to determine degree of success in meeting the goal

Outcomes: Briefly describe the current state of progress toward meeting the goal

Goal	Measure of Success	Measurement	Outcome	Possible Reason(s) for Outcome	Conclusion	Further Action
Review CORS for Math 57, Math 50 and Math 40	Completion of CORs and adoption by CMC Board of Trustees		CORs were adopted by CMC Board of Trustees, Spring 2007		Goal was completed and new texts and CORs were in effect, Fall 2007	
Update CORS in remaining math, physics and statistics courses	Completion of CORs and adoption by CMC Board of Trustees		CORs were adopted by CMC Board of Trustees, Fall 2007 and Spring 2008 (PH2A, PH2B, PH4A and PH4B)		Goal was completed and new texts and CORs will be effective , Fall 2008	
Complete Basic Skills Initiative (BSI) self study for CMC	Completion of CMC self study as directed by Sheri Holbrook, CMC Title V director		Self Study was completed in March 2008		Self Study was presented to CMC faculty senate and forwarded to Chancellor's office.	
Revise COR for Supplemental Math Labs (MATH 97 and MATH 98) – include Nursing (N1A) into pool of students	Completion of CORs and adoption by CMC Board of Trustees				Thacker	

Goal	Measure of Success	Measurement	Outcome	Possible Reason(s) for Outcome	Conclusion	Further Action
Re-evaluate Content and Scope of Math 57, 50 and 40 for appropriate depth and coverage of material.	Students will be better prepared for subsequent math courses. Math 40 will be a better prerequisite for transferable level mathematics. This should improve how Courses complement and flow into each other. Math 40 has some topics that need more coverage and some that might need less coverage.				Berger, Christensen, Thacker	
Evaluate retention and success rates of online courses and investigate ways to improve the online/hybrid components – if necessary.	Retention and success rates of online and hybrid math courses				Berger will do research	
Evaluate website components available with math textbooks. Investigate the possibility of using web access cards without buying hardcopy of textbook.	Increased use of student resources in all math classes				Berger, Thacker	

Investigate the feasibility of creating pre-test and post-tests for basic skills classes.	Implementation of assessments at some levels will communicate to faculty and students the expectations of the college and ensure student preparedness.				Berger, Brenner	
<b>Goal</b>	<b>Measure of Success</b>	<b>Measurement</b>	<b>Outcome</b>	<b>Possible Reason(s) for Outcome</b>	<b>Conclusion</b>	<b>Further Action</b>
Develop a master schedule each semester that would allow students to stay with the same teacher if they desire.	Students will be able to cycle through the math curriculum with the same teacher.				Thacker	

- If you have set goals in the past for your program, use this template to revisit and assess achievement of those goals and discuss/present reasons for outcomes and further action as is deemed necessary.
- If you are going through Program Review for the first time, save this template for use in your work plan as you will set goals and will need a plan for comparison and measurements.

**SWOT Analysis  
Mathematic Program Review**

**Instructions:** Use this form to document the program analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT). This is a rapid process usually conducted using group brainstorming as a technique. It should be able to be accomplished in a one-hour meeting or can even be conducted as an individual exercise utilizing e-mail communication if it is impossible to find time for the stakeholder group to meet. Be creative here, if you like. One suggestion is to ask external stakeholders to create their own independent SWOT as a reference during Program Review.

<p><b>Strengths</b> (Internal to the Program)</p>	<ol style="list-style-type: none"> <li>1. Qualified full time mathematics instructors.</li> <li>2. Well-balanced math offerings throughout the day and week each semester.</li> <li>3. Course Outlines of Record have been completed in all math courses during the past two years.</li> <li>4. Curriculum has been reviewed and textbooks have been selected that give a good vertical transition.</li> <li>5. A group of competent, qualified adjunct faculty.</li> <li>6. New math software (MatLab, SmartView, MathType) and hardware (Symposium) funded by Basic Skills Initiative.</li> <li>7. Course Outlines of Record has been revised so that MATH1A and MATH 1B to meet LDTP requirements.</li> <li>8. Tutoring program for math students through the Student Success Center and EOPS ambassador.</li> </ol>
<p><b>Weaknesses</b> (Internal to the Program)</p>	<ol style="list-style-type: none"> <li>1. At least two additional full-time instructors are needed in the department.</li> <li>2. Goals have never been stated for this program; these need to be a collaborative effort of full time staff.</li> <li>3. Use of effective teaching strategies for basic skills students.</li> <li>4. Available data from the student survey conducted Springs 2008 has not been analyzed and used for program changes.</li> <li>5. Institutional data should be used for an in-depth study of attrition, course rigor, and success rates.</li> <li>6. More study is needed regarding the effectiveness of online and hybrid math courses. Issues of attrition, rigor, success rates, and teacher access to students are issues.</li> <li>7. Detailed analysis of available data should be ongoing and continuous.</li> </ol>
<p><b>Opportunities</b> (External)</p>	<ol style="list-style-type: none"> <li>1. New management is more open to necessary investigation and changes in programs.</li> <li>2. The Basic Skills Initiative is giving the school a chance to investigate effective teaching strategies for the school. Money is available for teacher training, research, and purchase of necessary items to insure student success at all levels.</li> </ol>

	<p>3. New division chairs may give instructors more support and structure at the program and scheduling levels.</p>
<p><b>Threats</b> (External)</p>	<ol style="list-style-type: none"> <li>1. Limited number of qualified adjunct faculty in the district could limit the number of sections that are offered.</li> <li>2. Placement of students into appropriate math classes. A new study of the Accuplacer scores and other measures of placement need to be completed.</li> <li>3. Lack of funding for basic classroom and office supplies for instructors. A department fund of \$150 is available, but is inadequate for a department with 25 sections of math, 4 full time and 8 to 12 part time instructors.</li> </ol>

**Work Plan**

**Instructions:** Complete each element.

- Distribute the completed Work Plan to all internal & external stakeholders
- Goal: State the desired change or activity that is to take place. This may be only 1 or 2 items. Be careful to keep the Goal(s) realistic and manageable in number. It is better to plan to improve 1 or 2 things and make true progress.
- Resources Required: Identify what will be needed to accomplish the goal.
- Actions/Steps: Identify each “thing” that needs to be done to achieve the goal.
- Measurement: Describe how progress will be measured. This is usually a formula of data elements.
- Evaluation: State whether or not the goal was achieved and why or why not.
- Person Responsible: Identify who will be responsible for performing each of the Actions/Steps
- Target Completion Date: Set target dates for each of the Actions/Steps

Goal	Resources Required	Actions/Steps	Measurement	Person Responsible	Target Completion Date	Evaluation
Begin integration of CMC core competencies into the math program through completion and coordination of SLOs at the course, program and institutional levels.	Coordination and cooperation of math program faculty. Time for meetings	Timelines and agendas for meetings to complete the task.	Completion of course SLOs and matrix pairing the course SLOs with CMC core competencies.	Brad Berger Michael Chlebik Jeanne Cosby Tony Thacker Adjunct faculty	June 2009	
Mathematics faculty attend at least one math, technology, or basic skills conference per year.	Funding of conference fees, travel, and class substitutes paid by college.	Faculty seek out conference opportunities that fit each individuals professional interest and needs.	Proof of attendance and sharing of information with other math and/or full faculty.	Brad Berger Michael Chlebik Jeanne Cosby Tony Thacker	annually	



Goal	Resources Required	Actions/Steps	Measurement	Person Responsible	Target Completion Date	Evaluation
A standard Chapter 1 test for Pre Algebra will be administered in all Math 57 classes. Results will be used to help advise students who may need to go back to DE 300 – Basic Skills Math.	Cooperation of math faculty Construction of Chapter 1 (Whole Numbers) assessment	Construct Chapter 1 test (establish standards: calculator use, time in semester, reporting of results)	Test will be administered to all Pre Algebra classes.	Tony Thacker	August 2008 January 2009	
Establish baseline data for attrition, success rates, GPA measures with respect to all sub groups.	Available data (prior to 2006); data from researcher (2006 – present); time to analyze	Analyze data and compare to other California Community College as reported by Chancellor’s office	Data (beyond 2006) will be requested of researcher for appropriate analysis.	Brad Berger Michael Chlebik	June 2009	
Revise Course Outline of Record for MATH 13 (Liberal Arts Mathematics)		Re-write course description and present to appropriate curriculum committees.	Course description will reflect LDTP requirements	Tony Thacker	March 2009	

Goal	Resources Required	Actions/Steps	Measurement	Person Responsible	Target Completion Date	Evaluation
Re-evaluate Content and Scope of Math 57, 50 and 40 for appropriate depth and coverage of material	Discussions with instructors to determine realistic coverage of material	Analysis of current text to determine the most important topics.	Completion of revised CORS	Brad Berger, LeeAnn Christensen, Tony Thacker	June 2009	
Evaluate retention and success rates of online courses and investigate ways to improve the online/hybrid components – if necessary.	Appropriate data from 2007 to present.	Gather and analyze data. Investigate current online offerings at other community colleges.	Implementation of well-developed online and hybrid courses that reflect effective practices.	Brad Berger	June 2009	
Evaluate website components available with math textbooks. Investigate the possibility of using web access cards without buying hardcopy of textbook.	Web and CD access to student resources.	Learn the new resources available and compare to the hard-copy texts.	Increase student usage of website and CD resources. Possible decreased spending for students.	Brad Berger, Tony Thacker	June 2009	
Investigate the feasibility of creating pre-test and post-tests for basic skills classes	Test generators for each course (currently available)	Identify basic entrance and exit skills for each course and develop assessments for each.	Creation of pre- and post-assessments for courses.	Brad Berger Sam Brenner	June 2009	

**Executive Summary:  
Program Review and Work Plan**

**Program Name Mathematics**

**Category:**

Program  (Degree  Certificate  General Education  Vocational   
Instructional  Direct Instructional Support  Indirect Instructional Support

Process Leader: Tony Thacker

Lead Administrator Bruce Bridenbecker, Division Chair

**Review Process** Start Date (m/d/yy) 5/27/08 Completion Date (m/d/yy) 11/7/08

Advisory Committee Meeting held on Date (m/d/yy) 10/21/08

Attendees: Mathematics Full time Faculty: Brad Berger, Michael Chlebig, Tony Thacker,

Mathematics Adjunct Faculty: Sam Brenner, LeeAnn Christensen Counseling, DSPS: Jackie Hanselman

Recorder: Rose Resurrecion

Summary of Data/Input review and findings (include reference to attachments):

The Mathematics Program offers a transfer degree in Mathematics. The courses that are offered at CMC include required courses for a mathematics degree, transferable algebra, precalculus and statistics classes for general education students and basic skills classes for the underprepared student. During Fall 2008, courses are taught by 4 full time faculty and eleven adjunct faculty. Mathematics enrollment trends, attrition and student success rates from 2003 - 2006 are shown in the attached tables and graphs. While the trends show a decrease in enrollment during that time period, the numbers have increased through 2008.

Attached is Form B, Mathematics Program Data and Input and supporting items #1 - 30 in the appendix.

Summary of Work Plan (include reference to attachments): The immediate goals of the Mathematics Department include: 1) further integration of core competencies into the curriculum, 2) re-evaluation of Form G Executive Summary - Program Review Process (11-14-07)

course content and scope of basic skills courses, 3) evaluation of online and hybrid courses and 4) investigation of the feasibility of including pre-and post-assessments into courses. Goals are described in more detail on Form C1, Mathematics Program Current Status; Ford D, SWOT Analysis; and Form F, Mathematics Department Work Plan. The academic senate of the college has included the addition of two full-time tenure-track mathematics instructors for 2nd and 3<sup>rd</sup> priority hiring for the 2009-2010 year.