

MATHEMATICS

Curriculum Review Self-Study

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May 18, 2007

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Summary

The most useful part of Curriculum Review was the **Analysis of Course Offerings** even though this is not part of the official CRC task list. We had not looked at our course offerings in this manner. We discovered many things about our current courses. The most surprising to us is that nearly half of our classes are developmental (Elementary Algebra and below) and that 60% of these developmental classes are taught by adjunct faculty. We need to devote more of our collective energy to the developmental level and find ways to support the adjuncts. The Developmental Education Committee is in the process of proposing a new program for developmental education that will help to address this issue. We also teach 44% of our courses in the evenings and almost 60% of these are taught by adjuncts. As an institution, we need to provide more support to these night students and adjuncts. Another item we found enlightening is that almost 60% of our courses are taught with only one meeting per week. We agree that this is not the best format for the learning of the mathematics, but it is often more convenient for the teachers and the students. The charts in this section are not required in the Curriculum Review Packet, but we found the data very important.

In studying the **Comparable Courses** at all Community Colleges in the State of Michigan, I found that our courses are consistent with the other Community Colleges. Our classes also **transfer** to four-year schools as expected. We are right in line with the mathematics curriculum across the State.

Our **Catalog Course Descriptions** all need minor updating. We need to update the topics and work on the wording. After reviewing the current course descriptions, the majority of the discipline felt that our classes are too broad and not deep enough. A committee will begin looking at all of these items during Summer 07 to have something to present to the discipline by Fall 07.

The **Syllabus Review** was not in depth; however it did reveal that we need

to do a better job of communicating the syllabus components to our full-time and adjunct faculty.

The **Enrollment Trends and Student Retention** information indicates that we are below the College's expectations on number of withdrawals and student course completion rates. We need to help students understand what it takes to succeed in our classes and then make sure that they do it. The Math Department is responsible for about 13% of all of the course offerings at OCC.

Our other **needs** are: better support of adjunct faculty, help with implementing computer software, better support of our tutors and math labs, and night support for PASS students.

While many programs require students to have some math as a prerequisite, only two faculty members responded to the **Interdisciplinary** survey. They did not indicate any need for revision. We would like to revisit the curriculum of the Tech Math classes with the technology faculty.

Math teachers cover our **General Education** attributes; however we do not document the formal or informal assessment of the attributes. We need more discipline specific training on best practices for assessing our attributes in the classroom.

After the **1998 Review**, a committee was formed to work on placement. We led the College by implementing mandatory placement using COMPASS in all of our math classes when Datatel allowed us to hold the prerequisites. We are pleased with the results of having the right students in the right classes, although this has not yet improved our success rates.

Catalog Course Descriptions

MAT 1040 Fundamentals of Arithmetic 3 Credits

Replaces MAT 1110.

Prerequisite: COMPASS math placement test results appropriate for This course within the last two years.

Addition, subtraction, multiplication, and division of whole numbers; prime and composite numbers; divisibility; fractions and decimals; rounding and estimating; word problems; ratio and proportion; percent and applications; exponents and square roots; length, area, and volume; operations with integers; solving basic algebra equations.

MAT 1050 Preparation for Algebra 4 Credits

Prerequisite: COMPASS math placement test results appropriate for This course within the last two years.

This course is designed for the student who has very little or no algebra and plans to take Elementary Algebra. Topics will include whole numbers, fractions, and decimals; ratio, proportion, and percent; positive exponents and square roots; perimeter, circumference, area, and volume; Pythagorean Theorem; positive and negative numbers; solving equations and word problems; operations with polynomials; graphs of lines; slope. Instruction will emphasize math study skill development and will be varied to include lecture, discovery, and practice.

MAT 1070 Business Mathematics 3 Credits

Replaces MAT 1010.

Prerequisite: COMPASS math placement test results appropriate for This course within the last two years.

Review of addition, subtraction, multiplication, and division of whole numbers, fractions and decimals; computing the average; ratio and proportion; working with percent; application of all the above to problems involving profit and loss, time card, payroll, cash and trade discounts, the invoice, markup, depreciation, small loans and installment purchasing, simple and compound interest and applications; annuities; use of equations and formulas in the solution of business problems.

MAT 1100 Elementary Algebra 4 Credits

Prerequisite: MAT 1050 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

Properties of real numbers; first degree equations and inequalities; word problems; integer exponents; polynomials and factoring; rational expressions; graphing linear equations and inequalities; solving systems by graphing, addition and substitution; radicals; quadratic equations and the quadratic formula.

MAT 1140 Plane Geometry 3 Credits

Prerequisite: MAT 1100 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years

General Education Attributes: 2, 3

The study of the properties and characteristics of geometric figures through an axiomatic approach that focuses on proof and the building of a logical system. In particular, the material includes angles, similarity and congruence of triangles, parallel and perpendicular lines, quadrilaterals, right triangles, circles, area and volume, and constructions.

MAT 1150 Intermediate Algebra 4 Credits

General Education Attributes 3, 7

Prerequisite: MAT 1100 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

Review of basics from elementary algebra; absolute value equations and inequalities; radical and rational exponents; complex numbers; completing the square; the discriminant; quadratic inequalities; equations of lines; systems of equations; conic sections; functions, inverses and their graphs; word problems; exponential and logarithmic functions.

MAT 1500 Finite Mathematics 4 Credits

Replaces: MAT 1550

Prerequisite: MAT 1150 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes: 3, 7

Designed primarily for business and social science students. Elementary functions, systems of linear equations, linear models, matrix theory, linear programming, set theory, combinatorials, probability theory, and decision making. NOTE: This course will not substitute for MAT 1540, 1560, or 1630 as preparation for MAT 1710.

MAT 1540 College Algebra 4 Credits

Prerequisite: MAT 1150 (or equivalent college transfer course) with a "C" or better within the

last three years or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes 3, 7

Brief review of algebra fundamentals; equations quadratic in form; rational inequalities; graphing polynomials and rational functions; algebra of functions; including composition; inverse functions; theory of equations, Rational Root Theorem and Descartes' Rule; exponential and logarithmic functions; matrices, determinants and linear programming; partial fractions; conic sections; sequences and series; permutations and combinations; Binomial Theorem.

MAT 1560 Trigonometry 3 Credits

Prerequisite: MAT 1150 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes: 3, 7

Definition of the trigonometric functions as circular functions; graphs of the trigonometric functions; development and use of identities; solution of equations; inverse functions; applications; definition of the functions in a right triangle; solution of right triangles; solution of non-right triangles by use of Law of Sines and Law of Cosines; complex numbers and De Moivre's Theorem; vectors; polar coordinates.

MAT 1580 Statistics 4 Credits

Replaces MAT 1530.

Prerequisite: MAT 1150 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes: 3, 7

Organization and presentation of data; analysis of data, including mean, median, mode, range, and standard deviation; elementary probability theory using combinations and permutations; Binomial Distribution; Normal Distribution; Student Distribution; Chi-square Distribution; F-Distribution; hypothesis testing; estimation, regression and correlation, analysis of variance (ANOVA), non-parametric statistics. Introduction to statistical analysis using current technology.

MAT 1600 Applied Calculus 4 Credits

Prerequisite: MAT 1500, or MAT 1540 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years

General Education Attributes: 3, 7

Designed primarily for business and social science students. Elementary functions, the limit of a function, the derivative, techniques of differentiation, the exponential and logarithmic functions with derivatives and applications, the integral, techniques of integration, applications of the integral, and introduction to multi-variable calculus. Note: Will not substitute for MAT 1730.

MAT 1630 College Algebra and Trigonometry 4 Credits

Replaces MAT 1610.

Prerequisite: MAT 1540 and MAT 1560 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years

General Education Attributes: 3, 7

This course is meant to be a review of the real number system and basic algebra, including inequalities, absolute value, exponents and radicals; functional notation and composition of functions; linear and quadratic functions; rational and algebraic functions; exponential and logarithmic functions; definition of trigonometric functions using the unit circle; graphs of the trigonometric functions; development and use of identities; right triangle trigonometry; Law of Sines; Law of Cosines; complex numbers including trigonometric form; theory of equations; theory and application of matrices and determinants; inverse functions.

MAT 1730 Calculus I 4 Credits

Replaces MAT 1710 (2001-2).

Prerequisite: MAT 1630 (or equivalent college transfer course) with a "C" or better within the last three years, or MAT 1540 and MAT 1560 (or equivalent college transfer courses) with a "C" or better within the last three years, or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes 3, 7

Limits; continuity; concept of the derivative; differentiation of algebraic and transcendental functions; applications of the derivative; antidifferentiation; the indefinite integral; the definite integral; the Fundamental Theorem of Calculus; numerical integration; integration involving logarithmic functions; some applications of the integral. Some of the course concepts will be explored and/or enhanced with current technology.

MAT 1740 Calculus II 4 Credits

Replaces MAT 1720 (2001-2).

Prerequisite: MAT 1730 (or equivalent college transfer course) with "C" or better.

Integrals involving inverse trigonometric functions; hyperbolic functions; an introduction to

differential equations; applications of the definite integral; techniques of integration; limits of indeterminate forms; improper integrals; two-dimensional analytic geometry using polar coordinates and parametric equations; infinite series. Some of the course concepts will be explored and/or enhanced with current technology.

MAT 2530 Mathematics for Elementary Teachers I 4 Credits

Replaces MAT 2510.

Prerequisite: MAT 1150 (or equivalent college transfer course) with a "C" or better within the last three years or COMPASS math placement test results appropriate for this course within the last two years.

General Education Attributes: 1, 2, 3

Throughout This course students will be introduced to the National Council of Teachers of Mathematics (NCTM) Standards and will participate in their implementation. Students will work in collaborative problem solving groups, make presentations to the class, learn and teach a math game, work with manipulatives, observe an elementary school classroom, and share ideas with the purpose of developing philosophy and attitude as well as improving speaking, writing, thinking and computational skills. Math content includes elementary set theory; basic algorithms of arithmetic including operations using whole numbers, integers, fractions, decimals and percents; the binary number system and other non base 10 systems; elementary number theory; logic; problem solving techniques; student usage of calculators, computers and other technology.

MAT 2540 Mathematics for Elementary Teachers II 4 Credits

Prerequisite: MAT 2530 (or equivalent transfer course within the last three years) with a "C" or better.

Course topics will be developed with the use of problem solving strategies, manipulatives, technology, and collaborative learning in conjunction with NCTM and AMATYC standards. Topics include solving equations and inequalities, graphs and equations of functions, elementary probability and statistics, informal geometry (including symmetry and transformation, similarity and congruence, area, perimeter, and volume), and systems of measurement. Topics will be taught with emphasis on effective teaching methodology. Students will be encouraged to share ideas and make presentations to the class, develop philosophy and attitude, and improve their speaking, writing, and thinking about mathematics.

MAT 2740 Calculus III 4 Credits

Replaces MAT 2710 and MAT 2730 (2001-2).

Prerequisite: MAT 1740, or equivalent college transfer course with "C" or better.

Three-dimensional analytic geometry and vectors; multivariable functions; partial differentiation with applications; multiple integrals and applications; cylindrical coordinates; vector calculus. Some of the course concepts will be explored and/or enhanced with current technology.

MAT 2810 Differential Equations 4 Credits

Prerequisite: MAT 1740 (or equivalent college transfer course with "C" or better.

This is a first course in ordinary differential equations. It includes solution of principal types of first order differential equations with applications, solution of higher order linear equations by undetermined coefficients and by variation of parameters, solution by using infinite power series, solution of linear equations by Laplace Transforms, matrix solution of systems of linear differential equations, and solution and applications of higher order differential equations.

MAT 2880 Linear Algebra 4 Credits

Prerequisite: MAT 1740, or equivalent college transfer course with "C" or better.

The topics covered are systems of linear equations, matrix operations and properties of matrices, vector spaces (subspaces of R^n linear transformations, determinants, Eigenvectors and Eigenvalues, diagonalization and inner products. Although not required, MAT 2740 is recommended before enrolling in this course.

Catalog Course Description Summary

After surveying the Mathematics discipline, we determined that most of these course descriptions need some revision and have assigned the coordination of these revisions to one of our department members. The revisions are cosmetic or include minor content changes. We would like to remove the line that says "replaces ..." in the descriptions that have it. The replacements occurred several years ago and we feel that this is no longer necessary. Also, we are in process of determining how to include ACT scores in our prerequisites. This may require a change in the wording of the prerequisites. It makes sense to do all of these changes at the same time and while we are doing some minor changes, we should be sure that all of the topics are appropriate to the class. This process is underway with a target of Fall 2007 to present suggested changes to the discipline.

Analysis of Current Course Offerings

Winter 07 Classes

We offered 235 classes (not cancelled).

course		total	TOTAL	TOTAL	%	%			
		sections	FT	AD	FT	AD	Dev		
1040	Arithmetic	18	3	15	17%	83%	total	116	49%
1050	PreAlgebra	36	14	22	39%	61%	FT	AD	
1070	Business Math	2	0	2	0%	100%	46	70	
1100	Elementary Algebra	60	29	31	48%	52%	40%	60%	
1140	Geometry	1	0	1	0%	100%			
1150	Intermediate Algebra	50	28	22	56%	44%	not Dev		
1500	Finite Math	5	2	3	40%	60%	total	119	51%
1540	College Algebra	15	13	2	87%	13%	FT	AD	
1560	Trigonometry	9	8	1	89%	11%	74	45	
1580	Statistics	11	4	7	36%	64%	62%	38%	
1600	Business Calculus	4	3	1	75%	25%			
1630	Precalculus	2	0	2	0%	100%			
1730	Calculus I	8	6	2	75%	25%			
1740	Calculus II	5	5	0	100%	0%			
2530	Math for Elem Ed I	3	1	2	33%	67%			
2540	Math for Elem Ed II	2	0	2	0%	100%			
2740	Calculus III	2	2	0	100%	0%			
2810	Differential Equations	1	1	0	100%	0%			
2880	Linear Algebra	1	1	0	100%	0%			
total		235	120	115	51%	49%			

The Mathematics Department has 25 full-time faculty members and an army of adjuncts. The full-time faculty have a college-wide agreement to teach all classes in the Calculus sequence, Differential Equations and Linear Algebra. We do have extenuating circumstances some semesters that necessitate using adjuncts in these classes, but we try to avoid it if possible. We have a campus rotation chart for the higher level classes that is maintained by the chairs of the campus departments.

One of the things that surprised us as we looked at the course offering chart is that about half of our classes are taught at the developmental level. We do not devote half of our energy to these classes. The Developmental Education Proposal will help us give these classes more of our attention. We need to develop more assistance for the adjuncts that teach at this level, especially at night. The full-time faculty do not teach many night developmental classes since there are higher-level classes that need to be taught in the evenings and it is easier to find adjuncts to teach the low levels. The department chairs are overwhelmed by the number of adjunct faculty and the variety of classes that they teach at the college.

Many of the adjuncts that we use are high school teachers, current or retired. But, our curriculum does not line up with most high school coursework, so adjunct faculty must be given more support than receiving a textbook on the first day of class and then set free.

We have some classes that are not offered very often—Business Math, Geometry, and Precalculus. The full-time faculty do not often teach these classes and so it is difficult to get input on the appropriateness of the catalog course descriptions.

Day/Night

The following table is a breakdown of the day/night offerings. Most full-time faculty teach at least one night class, but with the volume of night classes we offer, we do not have enough full-time faculty to cover most of the night classes. The problem is that the full-time faculty prefer to teach day classes, and we teach a majority of the day classes. In some semesters on some campuses there are not enough day classes for the full-time faculty and so we do not propose to increase the number of full-time day faculty. Also, most campuses offer so many classes each evening that in order to cover a higher percentage of the night classes with full-time faculty, we would need to have faculty dedicated to the night classes. In our current contract, there is no provision for dedicated night faculty.

1100 and below	Total #	# of day	# of night	# of Sat.	% of total by FT/AD	% of day by FT/AD	% of night by FT/AD	% of Sat. by FT/AD		
all	116	62	50	4	FT/AD	FT/AD	FT/AD	FT/AD		
FT	46	45	1	0	40%	73%	2%	0%		
AD	70	17	49	4	60%	27%	98%	100%		
1140 and above	Total #	# of day	# of night	# of Sat.	% of total by FT/AD	% of day by FT/AD	% of night by FT/AD	% of Sat. by FT/AD	# of online	% of online by FT/AD
all	119	59	54	3	FT/AD	FT/AD	FT/AD	FT/AD	3	FT/AD
FT	74	49	22		62%	83%	41%	0%	3	100%
AD	45	10	32	3	38%	17%	59%	100%		0%
all	235	121	104	7		51%	44%	3%	3	1%

Meetings per week

The table below shows the meetings per week of our classes. We offer 58% of our classes in a once a week format. We know that this is not educationally best for our students, but in many cases it is the most convenient for the teacher and for the student. It has been reported that not very many students want to come twice a week even if it is better for the learning of the material. We feel that the lower level classes especially should meet more than once a week to promote a better learning environment.

	two meetings	one meeting	online
day	37%	16%	1%
night	3%	43%	
total	40%	58%	1%

Campus Breakdown

The table below shows the number of classes at each campus. Highland Lakes is in process of hiring two full-time faculty members to replace retirees. After this hire, the percent of classes at each campus will be very close to the percent of full-timers at each campus.

	AH		HL		OR		RO		SF	
FT faculty members	8		3		7		7		7	
Percent of total FT	32%		12%		28%		28%		28%	
Classes	FT	AD	FT	AD	FT	AD	FT	AD	FT	AD
	38	31	18	18	32	26	28	31	4	9
Total classes	69		36		58		59		13	
Percent of total classes	29%		15%		25%		25%		6%	

Syllabus Review

Mandatory Items (per FMA and Federal Law)	23 syllabi
ADA Notification	70%
Course Goals	43%
Grading Standards and Practices	100%
Tentative Schedule of Assignments and Tests	100%
FERPA	0%
Recommended Items (per Academic Senate)	
Course Name and Number	100%
Instructor, Office Location, Method of Contact	100%
Office Hours	61%
Available Assistance	87%
Course Catalog Description with Prerequisites	74%
General Education Attributes (where pertinent)	30%
Required Books and Supplies	100%
List of Supportive Materials (where available)	48%
Evaluation/Testing System & Policies	96%
Attendance Policy	52%
Safety Instructions	0%
Disclaimer Allowing for Reasonable Revisions	9%
Optional Items	
Semester Meeting Times & Room	87%
Teaching/Learning Strategies	39%
Applicable Forms Pertinent to Course	4%
Reference to Student Policies in OCC Catalog	52%
Policy on Use of Computing Resources	4%
Description of Required Computing Skills	0%
Policy on Plagiarism	13%
Student Bill of Responsibilities	17%

Syllabus Review Summary

I asked the deans on each campus to forward their results from syllabi review. I only received data from the Highland Lakes Campus. The table shows the results from these syllabi. There were 23 syllabi reviewed. Only a few of the items were on every syllabus. We did have zeros on three items: FERPA, Safety Instructions, and Description of Required Computing Skills. We are waiting for the official language for FERPA since this is a new requirement. Safety Instructions and Computing Skills do not apply to math classes. We will need to send a memo to all math faculty members to emphasize the components of the syllabi that are required, recommended, and optional. Even if more syllabi were reviewed, the results would likely be the same and all faculty members, adjunct and full-time, need to be reminded of the necessary components of a syllabus.

Perhaps the college should find a better way to monitor the syllabi of the faculty.

Enrollment Trends and Student Retention Dashboard

The Dashboard data shows that we are above the target score in two categories: classes that are not cancelled and percent of minority students. We are within the expected range in the categories of sections filled to capacity and percent of incompletes. We are below the trouble score in two categories: percent of withdrawals and Student Course completion rate. Our percent of withdrawals is 28.6%. While some of the students withdraw because they are not performing at the level they would like, many students withdraw for reasons not connected to the class itself. The student course completion rate in mathematics is 51.9%. This percentage has been consistent for many years. I went back and looked at the data from before Datatel and it was about the same for all the semesters for which I could find data. We believe that it is comparable to mathematics classes at community colleges across the state. Many students find mathematics to be very difficult and while we support the students in numerous ways, not all students put forth the effort required to succeed.

measures	05-06	04-05	03-04
Sections filled to capacity	84.9%	83.3%	83.9%
Percent of completed sections (not cancelled)	91.9%	92.9%	93.6%
Percent of minority students	25.5%	25.1%	23.9%
Percent of withdrawals	28.6%	27.2%	26.2%
Percent of incompletes	1.8%	1.6%	1.9%
Student course completion rate (C or better)	51.9%	52.6%	46.6%
Dashboard score	8.69	8.61	8.40

We are above target in percent of completed sections and percent of minority students

We are below the trouble score in percent of withdrawals and student course completion rate.

Credit Hour Trends

Over the past ten years, our SCH total has been pretty consistent. We experienced a slight drop in 2002-03 which we believe is due to the implementation of mandatory placement. The numbers have recovered a little, but are not back to the pre-placement levels. The mathematics department is responsible for about 13% of the college SCH total.

	1995-96	1996-97	1997-98	1998-99	1999-00
	SCH	SCH	SCH	SCH	SCH
Mathematics	64,296	62,911	63,930	63,712	63,061
College Wide Totals	451,159	443,471	431,521	440,448	438,997
Percent	14%	14%	15%	14%	14%

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
	SCH	SCH	SCH	SCH	SCH	SCH
Mathematics	63,507	62,036	56,454	59,848	60,031	59,765
College Wide Totals	453,054	447,928	478,827	468,777	472,892	487,597
Percent	14%	14%	12%	13%	13%	12%

Discipline Needs and Resources

Each campus was asked to provide answers to the following questions.

Question 1: What resources or services does the Discipline/Program need in order to improve instruction? Please explain the reason you are requesting each resource.

Responses:

ASC & tutoring

We need a dedicated Math/Science person in each ASC. A high percentage of the tutoring and services provided in the ASC go to math students. Having a faculty member that has expertise in the math and science area would help to serve our students better.

The math faculty need release time on each campus to facilitate our Math Labs. We need more direct contact with the tutors in the math lab. We need to be involved in the hiring and training of the tutors.

The math tutors in the ASC and PASS offices need more extensive *discipline-specific* tutor training. We need to help the tutors so that they know what we expect of them, what they can expect of us, and how best to help our students.

The supplemental instructor program is not the same on all campuses. We need to make sure that all faculty have access to good SI leaders if they wish to have them.

We should offer mini classes at appropriate times in the semester that pertain to specific topics (like story problems, factoring) that students struggle with in classes like Elementary and Intermediate Algebra.

We could create some short videos that help students remember some math before they take the COMPASS test or during a class where they need remediation on individual topics.

Software & computers

All of our textbooks come with software or websites for the students to work on problems. We need places on campus that are proximate to our classrooms and offices that the students can go to work on these materials outside of class. We also need computer labs that we could take a class to on an as needed basis. The faculty need help understanding and implementing these online homework systems like "MyMathLab" and "MathZone", and "iLearn" and other math software such as Derive and Converge. We need IT tech support with computer classes and labs.

Faculty & Adjuncts

We offer a lot of our classes in the evening and many of these are at the developmental level. Our full-time faculty members do not teach very many of the developmental classes at night. We need a provision in the FMA to hire faculty dedicated to night and developmental classes. Currently, there is no such provision.

The math department needs developmental coordinators with release time for MAT 1040, 1050, 1100 on each campus. This is part of the Developmental Education Program that is being developed.

We need more support for adjunct training. We have so many adjuncts and too often they are given a text and an outline and set loose on our students. We need to do a better job helping our adjuncts know what we expect of them and our students and then conferring with them throughout the semester to make sure our expectations are realized.

PASS

OCC needs to have more offices open in the evenings, especially the PASS office. Since many of our developmental classes are taught at night, these students need support from the PASS office as much as the day students.

Interdisciplinary

For Mat 1050 and 1040, we need to investigate the use of manipulatives. We could call on the ASC and those that teach MAT 2530 & MAT 2540 to assist us with the training.

We should investigate teaching paired courses. In Winter 2008, a faculty member will teach a MAT 1050 class that will be paired with a ASC 1070 study skills class. We are working out the details on how students will register for both. As an experiment, we want to see if this enhances student learning.

Question 2: What curriculum revisions or development would enhance instruction in your Discipline/Program?

Responses:

All of our classes need to be re-evaluated as to the content that is appropriate. We have been adding topics without deleting obsolete topics. We have too much overlap in the material in sequential classes. Many of our classes are too broad and not deep enough.

We would also like to reopen discussions with the Technology faculty about the tech math classes. These should be taught through the math department.

Interdisciplinary Interactions

I sent an e-mail to several faculty members in other departments that require a math class for their programs. I received two responses that contained no suggestions for change.

We would like to reopen discussions with the technology faculty about the Tech Math classes. There was a committee a few years ago, but no progress was made. Currently, no math credit is given for Tech Math classes.

Members of the math department are open to offering paired courses with science classes or creating cross-discipline courses.

Comparable Courses and Transferability

Transferability

The chart below shows the transferability of our courses to seven universities that many of our students attend. It shows that our courses transfer as expected. Developmental classes do not transfer to universities. Some schools take some of our classes as general credits when they do not align with their courses (the blue boxes). Kettering does not accept as many of our courses as the others since they are a more specialized school.

OCC		Central	Eastern	MSU	Wayne	U of M	Kettering	Oakland
1040	Arithmetic	no	no	no	no	no	no	no
1050	PreAlgebra	no	no	no	no	no	no	no
1070	Bus Math	no	no	no	no	no	no	no
1100	Elem Algebra	no	no	no	no	no	no	prereq
1140	Geometry	no	no	no	no	no	no	no
1150	Int Algebra	MTH 105	Math 104	MTH 1825	no	no	no	prereq
1500	Finite Math	MTH cred	no	mth cr	mat1500	math dept	no	mth 121
1540	Coll Algebra	MTH 107	Math 105	mth 103	mat 1xxx	math 103	no	1540 &
1560	Trigonometry	MTH 106	Math 107	mth 114	mat 1xxx	math 105	no	1560 = Mth 141
1580	Statistics	Sta 282	Math 170	stt cr	sta 1020	stat dept	MATH 408	Sta 225
1600	Bus Calc	MTH 217	no	mth 124	mat 1xxx	math dept	no	Mth 122
1630	Precalculus	MTH cred	math 105&107	mth 116	mat 1800	math 105	no	mth 141
1730	Calculus I	MTH 132	math 120	mth 132	mat 2010	math 115	Math 101	mth 154
1740	Calculus II	MTH 133	math 121	mth 133	mat 2020	math 116	Math 102	mth 155
2530	Math for Elem Ed I	MTH 151	math 108	mth cr	mat 1110	math 385	no	mte 210
2540	Math for Elem Ed II	MTH 152	math 110E	mth cr	mat 1120	math dept	no	mte 211
2740	Calculus III	MTH 233	math 223	mth 234	mat 2030	math 215	math 203	mth 254
2810	Diff Eq	MTH 334	math 325	mth 235	mat 2350	math 216	math 204	apm 257
2880	Lin Alg	MTH 223	math 122	mth 314	mat 2250	math dept	math 307	mth 275

Comparable Courses

I looked at all 28 community colleges in Michigan to compare our courses to theirs. The table shows the number of Community Colleges in Michigan that offer each course. OCC's courses are listed first and then the other courses are listed after. All CC's in Michigan offer Elementary Algebra, Intermediate Algebra, Calculus I, Calculus II, and Calculus III. Most CC's have at least one class before Elementary Algebra such as our Arithmetic and Prealgebra, and at least one class between Intermediate Algebra and Calculus like our College Algebra and Trigonometry.

One class that we might consider offering is Technical Math. Our department has had discussions with the Technical faculty about the curriculum for that course, but the discussions fell apart with no decisions made.

All of our classes, except Business Math and Geometry, correspond with classes at more than half of the CCs in the state. Our course offerings are very much in line with the rest of the state.

	count out of 28	OCC course number
Arithmetic	24	1040
Prealgebra	17	1050
Business Math	5	1070
Elementary Algebra	28	1100
Geometry	6	1140
Intermediate Algebra	28	1150
Finite	15	1500
College Algebra	24	1540
Trigonometry	23	1560
Statistics	27	1580
Applied Calculus	14	1600
Precalculus	17	1630
Calculus I	28	1730
Calculus II	28	1740
Elem Teachers I	27	2530

Elem Teachers II	24	2540
Calculus III	28	2740
Differential Equations	19	2810
Linear Algebra	15	2880
Apprentice Math	2	
Technical Math	12	
Technical Math II	12	
Applied Alg & Trig	6	
technical Alg & trig II	5	
Intro-Computers- Programming	3	
C++Programming	2	
Nursing Math	7	
Math for health info tech	2	
Lib Arts Math	6	
study skills & apps	2	
applied Geom & trig	4	

Math Explorations	6
Int Alg-Extended	1
Alg for Calculus	1
Discrete	4
Special Projects	7
Fund of Math	1
lin Alg & diff eqn	7
basic Geometry	1
comp skills I	1
comp skills II	1
applied math	1
honors math seminar	4
Intro to CAS	1
Elem Teachers III	3
Arith & pre alg	1
College alg w/applic & tech	1
Business Stats	1
Math Clinic	1
Math Clinic	1
applied Alg I	1
Mini courses basic	1
elem alg Mini	1
honors calc I	1

honors calc II	1
prob & stat	3
Bus Math 2	1
metric system	2
math apps in Eng tech	1
electronics math	1
math approaches for parapros	1
intro to graphers	1
alg with coord geom	1
pre-alg & beg alg	1
indep study	3
fortran	1
internship/academic service	1
S/T math	1
shop/plant math	1
basic math refresher	1
business math -more	1
calc 4	1
math analysis I	1

General Education/Outcomes Assessment

The list below was sent to all members of the discipline as well as the adjuncts at OR. Of those sent out, I received 8 FT and 4 AD responses.

Our discipline has several classes that have attributes attached. The list shows the classes and the number of teachers (out of the 12 responses) who responded yes to each attribute. (Note: Low numbers indicate that the teachers are not teaching the class; rather than they are not teaching or assessing the attribute.)

GE Attributes Listed in the Catalog	Teaching	Assessing
MAT 1140		
2 Think critically and creatively	__0__	__0__
3 Solve problems analytically, systematically and insightfully	__0__	__0__
MAT 1150		
3 Solve problems analytically, systematically and insightfully	__11__	__11__
7 Be technologically and scientifically literate	__11__	__9__
MAT 1500		
3 Solve problems analytically, systematically and insightfully	__4__	__4__
7 Be technologically and scientifically literate	__4__	__4__
MAT 1540		
3 Solve problems analytically, systematically and insightfully	__8__	__8__
7 Be technologically and scientifically literate	__8__	__7__
MAT 1560		
3 Solve problems analytically, systematically and insightfully	__6__	__6__
7 Be technologically and scientifically literate	__5__	__4__

MAT 1580

3 Solve problems analytically, systematically and insightfully 5 5

7 Be technologically and scientifically literate 5 5

MAT 1600

3 Solve problems analytically, systematically and insightfully 1 1

7 Be technologically and scientifically literate 1 1

MAT 1630

3 Solve problems analytically, systematically and insightfully 1 1

7 Be technologically and scientifically literate 1 1

MAT 1730

3 Solve problems analytically, systematically and insightfully 5 5

7 Be technologically and scientifically literate 5 4

MAT 2530

1 Communicate effectively 1 1

2 Think critically and creatively 1 1

3 Solve problems analytically, systematically and insightfully 1 1

Assessment Summary

All math teachers regularly teach and assess students about solving problems analytically, systematically and insightfully. We use tests, quizzes and homework assignments involving word problems at all levels of mathematics. Many teachers often do quick assessments during class using walk-n-check or oral questions.

These classes all have applications that relate to technologic and scientific literacy. We also use graphing calculators in most of these classes which require the students to become proficient with this technology. Some faculty report no formal assessment of the technology attribute.

Math teachers adjust to the needs of the students during class on a daily basis. If most of the students do not understand a topic, we go over the material again. Our formal assessments are mostly tests, quizzes, homework, and worksheets, but we are assessing the students in an informal manner at all times. We use this information to revise our classroom time as well as our formal assessments as needed.

We need more *discipline specific* training on best practices for assessing our attributes in the classroom.

Recommendations from 1998

In 1998, the Curriculum Review Committee recommended:

- ◆ That dialogue be established between Tech/Applied Math faculty/program coordinators and the Math discipline, such dialogue to pursue such topics as, but not limited to, common goals, exit/transfer testing into current Math courses from technology programs.
- ◆ That the Discipline create a sample/generic course syllabus to be provided to all adjuncts to achieve greater uniformity for and among departments and their faculty.
- ◆ That a study be designed to explore data behind the reasons for low retention rates to include follow-up interviews with non-completers as well as analyses of what constitutes successful student behaviors, and that adequate resources be made available to institutionalize the findings of such study.
- ◆ That there be follow up on finding replacement for ASSET while Counseling and Math Disciplines communicate about explorations into alternative placement tools.
- ◆ That the Math Discipline send a report to the CRC during Fall '98 semester identifying its progress in achieving the outcomes of these recommendations.

There was a committee of math faculty and Tech Faculty formed to talk about tech math. The math department has been waiting for the tech faculty to respond with the topics that they want in such a class. This discussion should be resurrected.

The discipline has not created a college-wide syllabus for any class. There are sample syllabi available from the college as well as from the campus departments. We still need to emphasize syllabi components.

There was no study to explore low retention rates.

We instituted mandatory placement using COMPASS and enforcement of prerequisites starting in Fall 2002. A committee that included math faculty from all campuses and counselors met for several years to make this happen. We continue to study the effectiveness of the placement of our students.

There was a report to CRC in December 1998 about the progress of these recommendations.