

MATHEMATICS Program Review 2005 - 2006

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FACULTY

FULL-TIME FACULTY:

Alan Tussy Alfie Swan Brian Anderson Cathy Gong **David Casey** Robin Carter Hyeyi Paek J. Paul Swatzel Jo Morrison Joyce Low Karl Hunsicker Lucia Riderer Ralph Tippins Rick Nguyenhuu Robert Everest Sheila White **Shuling Cummins** Steve Odrich Mo Trad Eagle Zhuang

ADJUNCT FACULTY:

Albert Lam

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Noel Alvarado

Rahim Faradineh

Sing Leung Sun Ng

Theodore Hsu

Tieng Le

Todd Cadwallader-Olsker

Yousef Daneshbod

LIST OF CERTIFICATES/AWARDS OFFERED

This program does not currently offer any approved certificates or skill awards. 05-06 certificates offered: None offered

05-06 certificates offered: None offered 05-06 skill awards offered: None offered

Certificate Programs	Math Class
ASC Fast Track Automotive Technology	Math 129 or higher
Engine Performance, Diagnosis, & Emissions	Math 129 or higher
Toyota / Lexus Automotive Technology	Math 129 or higher
High Performance Institute	Math 115, or Math 129, or Math 130
Advanced Drafting Technology-CAD	Math 130
Public Works I	Math 115, or Math 129, or higher

LIST OF DEGREES (none)

MATHEMATICS SEQUENCE OF COURSES

MATH 017	Basic Math and Study Skills
MATH 020	Arithmetic Fundamentals
MATH 029	Pre-Algebra
MATH 040	Building Mathematics Confidence
MATH 090	Selected Topics in Elementary Algebra
MATH 115	Business Mathematics
	MATH 129 Elementary Algebra with Emphasis on
	Tech/Communication Skills
MATH 130	Elementary Algebra
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	Teen/Communication s
MATH 130	Elementary Algebra
MATH 131	Plane Geometry
MATH 148	Intermediate Algebra I
MATH 149	Intermediate Algebra II
MATH 150	Intermediate Algebra
MATH 151	Plane Trigonometry
MATH 160	Survey of Mathematics
MATH 162	Introductory Mathematical Analysis
MATH 165	Introductory Statistics
MATH 168	Mathematics for Elementary Teachers I
MATH 169	Mathematics for Elementary Teachers II
MATH 170	College Algebra
MATH 175	Pre-Calculus
MATH 190	Calculus with Analytic Geometry I
MATH 191	Calculus with Analytic Geometry II
MATH 210	Calculus with Analytic Geometry III
MATH 211	Differential Equations

CLASSES NOT OFFERED IN LAST TWO YEARS

MATH 010

MATH 040

These classes have not been taught for more that two years and will be removed from the curriculum.

The **Mathematics** program has adopted the Institutional General Education Competencies of Citrus College. The General Education Competencies (as set forth in the Academic Senate minutes dated August 25th 2004) are as follows:

Institutional General Education Competencies-Part of Institutional Mission

General education competencies serve as a common set of core curricular components identified and defined by faculty. Student learning outcomes are behaviors based on these competencies.

Any student transferring, completing a degree or certificates from Citrus College, must demonstrate effectively assessed awareness, understanding, knowledge, skills, and abilities in the selected competencies.

1. Communication (personal expression and information acquisition)

Examples:

Reading analytically and critically Speaking articulately Writing with clarity and fluency Listening actively

2. Computation

Examples:

Technology Computer proficiency
Math proficiency Decision analysis

Analyzing and using numerical data (Synthesis and evaluation)

Application of mathematical concepts and reasoning

3. Creative, Critical, and Analytical Thinking

Examples:

Curiosity Research

Analysis Learning Strategies
Synthesis Problem Solving

Evaluation Decision making

Creativity Aesthetic awareness

4. Community, Global Consciousness

Examples:

Respect for others beings
Cultural awareness
Ethics
Citizenship
Interpersonal skills
Lifelong learning

Community service Self esteem

Integrity Empathy

5. Technology/information competency

Examples

Basic computing and word processing

6. Discipline/subject Area Specific Content Material - Project Plan

PROGRAM DESCRIPTION

The mission of the Mathematics program is to provide general, lower division coursework leading to an associate degree, to meet the prerequisites of other courses, to prepare students to transfer to 4 year institutions and to empower students to be able to compete in the global economy. An increasing fraction of our students are coming to us unprepared for college work, so a large and growing part of our program is Basic Skills.

The program has 17 courses ranging from "Basic Math and Study Skills" through differential equations. Most of the coursework is sequential. Initial placement in the program is done through multiple measures, and most students take the Accuplacer placement test as part of this process. Our total student enrollment is approximately 4000 students per semester.

Approximately 2/3 of our course offerings are during the day and 1/3 are offered in the evening. We have three courses (Survey of Math, Statistics, or College Algebra) offered in a distance education format, and one course (Statistics) designated as "Honors."

PROGRAM STUDENT LEARNING OUTCOMES:

Students completing courses in the Mathematics department will have acquired understanding, knowledge, skills and abilities in the following competencies:

Communication

Math students will use proper vocabulary and notation when describing mathematical concepts. They will be able to read books and documents and extract quantitative information.

Computation

Students will have developed level appropriate computational skills. These will include numeric calculation, evaluation of expressions, analysis of data, and application of concepts.

Creative, Critical, and Analytical Thinking

Students will develop an understanding of, and curiosity toward, the physical world. They will develop the analytical skills to devise questions and propose quantitative solutions.

Community, Global Consciousness

Students will demonstrate computational skills and an understanding of mathematical reasoning that will increase self esteem and set them on the path of Lifelong Learning.

<u>Technology/Information competency</u>

Students will be adept at using instructional software found by navigating the Web and the Windows environment. Specific skills such as the use of Excel will be demonstrated in classes such as Statistics (165) and Business Math (115), and other applications will be used in appropriate courses.

Discipline Specific Content

Students will demonstrate competency at levels appropriate to the course. This level may range from Arithmetic through Differential Equations, and may include Statistics, Teacher prep, and other topics.

PROGRAM GOALS:

The goals of the program are:

- To make the students proficient with calculations.
- To help the students understand the importance of Mathematics.
- To allow the students to be comfortable with applying concepts of math.
- To prepare the students for subsequent courses.
- To prepare the students for transfer to other educational institutions.
- To prepare the students for the workforce.

SLO TIMELINE

The Mathematics Department will develop student learning outcomes for all Mathematics classes offered at Citrus College based on the following schedule.

Course Title Projected date to develop course outline

MATH 017 Basic Math and Study Skills	done
MATH 020 Arithmetic Fundamentals	
MATH 029 PreAlgebra	
MATH 115 Business Mathematics	
MATH 129 Elem Algebra/Technology	Fall 2007
MATH 130 Elementary Algebra	Fall 2007
MATH 131 Plane Geometry	
MATH 148 Intermediate Algebra I	
MATH 149 Intermediate Algebra I	
MATH 150 Intermediate Algebra	
MATH 151 Plane Trigonometry	Fall 2007
MATH 160 Survey of Mathematics	Fall 2007
MATH 162 Introductory Mathematical Analysis	
MATH 165 Introductory Statistics	
MATH 168 Mathematics for Elementary Teachers I	done
MATH 169 Mathematics for Elementary Teachers I	
MATH 170 College Algebra	Fall 2007
MATH 175 Pre- Calculus	Fall 2007
MATH 190 Calculus with Analytic Geometry I	Fall 2007
MATH 191 Calculus with Analytic Geometry II	Fall 2007
MATH 210 Calculus with Analytic Geometry III	
MATH 211 Differential Equations	

Any new classes created will include student learning outcomes.

The department will work with the curriculum development committee to ensure the course outlines are being developed according to standards developed by the committee.

MISSION

COMMENDATIONS

- 1. We provide lower division coursework leading to an associate's degree.
- 2. We deliver a high quality education for that allows students to transfer to 4 year institutions and compete with students in that environment.
- 3. Our college level courses articulate with UC, CSU and other schools.
- 4. Our courses teach skills that will allow our students to compete globally.
- 5. The diverse academic needs of our students are met with an appropriate mix of courses from arithmetic through differential equations.
- 6. Our faculty is becoming increasingly diverse; the department is ~50% female, and recent hires increase our ethnic diversity.
- 7. Our student demographics within math closely approximate the district student demographics. (Figs 1 & 2)
- 8. We have seen a 50% increase in our African-American population in our upper math courses in the past 5 years. (Fig 2)

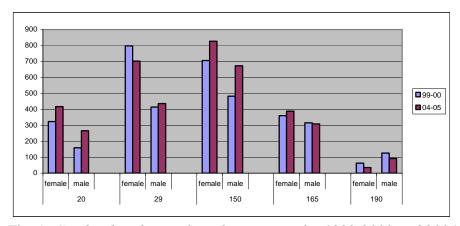


Fig. 1 Gender distribution for select courses for 1999-2000 and 2004-2005.

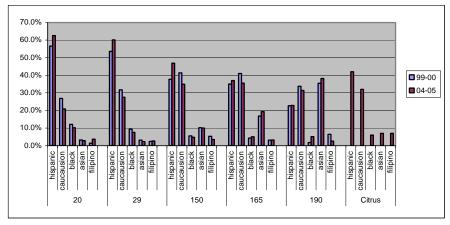


Fig. 2 Ethnic distribution for select courses 1999-2000 and 2004-2005.

PREVIOUS RECOMMENDATIONS COMPLETED

1. Need to meet with Counseling Department to develop a plan for successful placement of high school students.

We have made some progress, but need to stress the importance of the test to new students before they take the test.

RECOMMENDATIONS

- 1. There are disproportionately high numbers of Hispanics and Blacks in our Basic Skills classes, and relatively low numbers in our upper classes. We need to explore ways to advance more of these students to our upper level courses.
 - -Learning communities
 - -Outreach to High Schools
- 2. We need to attract more diverse and qualified faculty applicants.
- 3. Need to consistently schedule diverse instructors as role models in our higher level courses.

NEED

COMMENDATIONS

- 1. Math course are needed for Associate degrees, for transfer to UC, CSU, and private universities, and as prerequisites for other subjects.
- 2. Demand for teachers led to the creation of Math 168 & 169, "Math for Elementary Teachers"
- 3. Accuplacer scores confirmed observations of declining arithmetic skills. This led to the creation of Math 017, "Basic Math and Study Skills"

PREVIOUS RECOMMENDATIONS COMPLETED

1. Develop Technical math program.

A Business Mathematics (115) course has been developed that fulfills the requirement for an Associate's degree.

RECOMMENDATIONS

- 1. Adjust offerings to reflect new graduation requirements
- 2. Increase dialogue with K-12 to plan for near horizon trends
- 3. Dialogue with other departments to establish math prerequisites/recommendations for their courses.
- 4. Encourage counseling to direct Basic Skills students to take math courses EARLY in their Citrus careers.
- 5. Develop a Linear Algebra course.

QUALITY

COMMENDATIONS

- 1. Lecture and lab units for our courses are consistent with surrounding institutions.
- 2. Course outlines are regularly updated; all of our courses are scheduled to be updated between Spring '05 and the Fall of '07.
- 3. Student Learning outcomes are being added to all courses as they are updated.
- 4. Staff development funding is sufficient for faculty to attend 1-2 regional conferences annually.
- 5. Most math faculty are located near one another, allowing creative discussions to take place.
- 6. Math is involved in Learning Communities with Reading and Counseling courses.
- 7. Prerequisites for courses are validated by student success and consistency with neighboring schools.
- 8. Switching to Accuplacer as assessment tool has reduced initial student placement errors

PREVIOUS RECOMMENDATIONS COMPLETED

- 1. Find and validate an adequate assessment test.
- We transitioned to the Accuplacer test in the Fall of 2003. Faculty are happy with the change, though there is not yet enough good data to quantify an improvement.
- 2. Expand the math site to include all classes using 131, 151, 175 courses on current site as examples.

Steve Odrich has included these courses on the department's intranet site.

- 3. Need more technical and hands-on components in most math classes.
- Many faculty are experimenting with various computer aided instructional software such as ALEKS, TLE, and MyMathLab. Excel continues to be used where appropriate. Our Trigonometry instructor conducts outdoor experiments to illustrate the concepts, and instructors in our Basic Skills courses use group work and are exploring the use of "manipulatives".
- 4. Add units and hours to Math 150.
- One hour of instruction was incorporated into Math 150. The hour was converted to lecture in Spring '06.
- 5. Look into adding one hour arranged to Math 151 and adding some hands-on activities to the course.

One lecture hour has been added to Math 151.

- 6. Suggest changing class meetings for Math 160 from three weekly meetings to two weekly meetings.
- Math 160 has been offered in several formats; 2 days, 3 days, and DE. It has also been changed to 4 hours; 2.5 lecture, and 1.5 lab.

RECOMMENDATIONS

- 1. Cut-scores on the Placement Test need to be re-examined to continually improve student placement.
- 2. Examine content of differential equations course and look at the possibility of a course beyond differential equations.

- 3. Math 210 should be considered as a prerequisite for Math 211.
- 4. A common assessment tool should be investigated for courses with multiple sections.
- 5. Instructors in basic skills courses should be trained in techniques to reach adult learners of remedial material.

FEASIBILITY

COMMENDATIONS

- 1. There is a Math study center that is regularly staffed by student aides.
- 2. The Math department has taken over the new Math/Science building which has improved the learning environment for students.
- 3. Mathematics computer lab capacity has been increased from 36 to 71 workstations.
- 4. Math courses are scheduled in a flexible manner that allows students to progress through the courses efficiently.
- 5. Math courses are scheduled in several formats (day/evening, 2, 3, 4 or 5 days/wk) to attract different student audiences.
- 6. The math department is working with counseling to correctly place students.
- 7. Counseling has an open invitation for math faculty to attend/speak at their department meetings.
- 8. The math department has been successful at attracting high quality faculty.
- 9. Library resources are adequate.
- 10. The math department is fiscally sound as per the following table:

Year	ftes		credit revenue expenditure
03-04	1090	\$3,041,000	\$1,965,000(actuals)
04-05	1123	\$3,283,000	\$2,165,000(unaudited actuals)

PREVIOUS RECOMMENDATIONS COMPLETED

1. Increase capacity of Math Study Center to support students.

More tutoring hours have been scheduled, and a swipe station has been positioned in the lab to track student usage.

2. The department needs at least two more full-time teachers and a full-time lab supervisor.

Growth has been addressed through FNIC, and Steve Odrich has defined his role as Computer Lab Coordinator.

3. Consider developing non-credit program for pre-020 students.

Math 017 was developed to meet this need as not enough students placed themselves into an equivalent noncredit course. Math 017 is now a prerequisite for math 020

4. The Department needs to coordinate with part-time instructors to be sure they are receiving copies of syllabi and are following them, particularly knowing which

sections in text are to be covered. Suggest that faculty be designated for each course to coordinate with part-time faculty.

Course Overview documents are given to instructors new to a course. These documents are updated yearly by full time faculty.

5. Need one more full-time instructor in Basic Skills program.

Recent job announcements and hires have focused on Basic Skills instruction.

6. Need a new math building.

New building occupied Fall '05.

7. Need to analyze staffing and equipment needs as we incorporate more high-tech instructors into the curriculum.

We now have projection equipment in 6 classrooms and 3 classrooms with 30 student computers. There is also a staffed Computer lab with 70 student stations.

RECOMMENDATIONS

- 1. Improve quality of tutors in the study center by improving training, especially when working with Basic Skills students and by hiring tutors who can tutor statistics.
- 2. Improve training in Basic Skills, espc. for adult learners, for all faculty.
- 3. More offices for full time math faculty.
- 4. Work with counseling to get more basic skills students to take math courses in their first year.
- 5. New building needs improved climate control, more window blinds to prevent glare, relocation of some screens in classrooms, signage, and furniture in open areas.
- 6. Install wireless network in mathematics building to improve faculty and student flexibility.

COMPLIANCE

COMMENDATIONS

- 1. Course requisites meet Federal, State and District requirements
- 2. New Course Outlines meet all current requirements, and existing Course Outlines are being updated to reflect new requirements.

Key Program Performance Indicator	<u>01-02</u> Year 1	<u>02-03</u> Year 2	<u>03-04</u> Year 3	<u>04-05</u> Year 4	<u>05-06</u> Year 5	Year 6
Duraness Access						
Program Access						
Majors	N/A	N/A	N/A	N/A	N/A	
New Majors	N/A	N/A	N/A	N/A	N/A	
Courses Offered						
Day	33	35	34	32	36	
Evening	33	31	31	33	34	
Weekend	10	6	0	0	0	
Short Term	8	7	4	3	6	
Distance Education	5	6	6	6	4	
Classes Offered (# of sections)						
Day	169	174	170	192	219	
Evening	84	81	75	80	75	
Weekend	11	8	0	0	0	
Short Term	8	9	5	4	12	
Distance Education	5	4	6	5	4	
Registrations						
Weekly Student Contact Hrs (ave per term)	16785	17727	17253	17141	16666	
Full-Time Equivalent Students	1119	1182	1150	1143	1111	
Non- Traditional/Special Populations Available Jobs	0	0	0	0	0	
Program Res	ources					
Full-Time Equivalent Faculty	36.9	37.8	35.2	38.5	38.8	
Credit Reimbursement Rate	2794.76	2850.73	2790.53	2922.30	3259.71	
Revenue-FTES x Reimbursement Rate	3,141,310.2	3,372,413.59	3,206,318.97	3,825,290.7	3,605,239.26	
Total District	1,642,586	1,680,685	2,009,742	2,181,947	2,350,293	
Program Budget Personnel	1,634,972	1,667,071	2,009,742	2 2,168,933 2,350,293		
Grants	0	0	0	0	0	

Key Program	01-02	02-03	03-04	04-05	05-06	
Performance	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Indicator						
Supplies	7,614	13,614	13,614	13,014	13,614	
Industry Contributions	0	0	0	0	0	
VTEA	0	0	0	0	0	
Program Efficiency– FTES (budget)	977	990	1090	1123.6	1075.7	
Productivity – WSCH/FTEF (525=good)	455	469	490	445	430	
Average Class Size	30.6	31.3	32.7	30.3	29.6	
Fill Rate at Census	86.1%	86.7%	89.3%	84.2%	82.7%	
FTES per FTEF	26.5	26.2	31.0	29.2	27.7	
Cost per FTES	1681.2	1697.7	1843.8	1941.9	2184.9	
Cost per Major	0	0	0	0	0	
Program Success						
Course Retention (D or better)	58.5%	57.9%	60.1%	62.3%		
Course Success – Any Course (C or better)	48.4%	48.1%	48.7%	51.3%		
Course Success – Next						
Course (C or better)						
Course Success –						
Advanced Course (C or better)						
Major Persistence	N/A	N/A	N/A	N/A	N/A	
Degrees Awarded	N/A	N/A	N/A	N/A	N/A	
Certificates Awarded	N/A	N/A	N/A	N/A	N/A	
Skills Awards	N/A	N/A	N/A	N/A	N/A	
Licenses	N/A	N/A	N/A	N/A	N/A	
Transfers						
Performance Following Transfer						
Student Satisfaction*	N/A	N/A	N/A	N/A	N/A	
Employment Rate*	N/A	N/A	N/A	N/A	N/A	
Employment Retention*	N/A	N/A	N/A	N/A	N/A	
Employer Satisfaction*	N/A	N/A	N/A	N/A	N/A	

Key		01-02	02-03	03-04	04-05	05-06	
Performance Indicator		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Student Demographic Data		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Gender	Female	4158	4540	4467	4244		
Gender	Male	3008	3203	3241	3416		
Age	< 17	32	34	25	22		
Age	17 - 19	2680	2921	3053	3373		
Age	20 - 24	2574	2815	2778	2694		
Age	25 - 29	756	810	754	688		
Age	30 - 39	640	660	628	513		
Age	40 - 49	360	364	354	274		
Age	50 - 59	109	115	98	79		
Age	60 - 69	14	23	18	16		
Ethnicity	Hispanic	3017	3308	3347	3407		
Ethnicity	Caucasian	2416	2561	2483	2298		
Ethnicity	Black	389	421	413	428		
Ethnicity	Asian	653	635	662	693		
Ethnicity	Filipino	222	260	253	234		
Ethnicity	Native American	64	77	62	49		
Ethnicity	Pacific Islander	35	41	48	46		
Ethnicity	Other Non White	120	141	147	166		
Ethnicity	Unknown	250	299	293	339		
ED Goal	AA or AS Degree	626	676	644	663		
ED Goal	Degree & Transfer	3678	3936	3930	3983		
ED Goal	Transfer No Deg	2075	2174	2221	2181		
ED Goal	Certificate	235	286	276	257		
ED Goal	Job Skills	182	182	191	143		
ED Goal	Personal	273	336	270	244		
ED Goal	Unknown	97	153	176	189		

^{*}Vocational Programs Only