Mathematics Department Program Review
Coconino Community College
Submitted 9/15/17

I. OVERVIEW

a. Narrative

The CCC Math Program provides a sequence of math courses for students needing either review of pre-college level topics, college level topics, and/or degree core math content. Math courses are required in 35 degrees and 8 certificates offered by the college and are a core component of our General Education sequence. CCC provides developmental courses for students entering college with reduced mastery, offering the necessary course sequence for students to achieve success in college level courses. This sequence consists of three math courses, 088, 091, and 097. There are also two support courses MAT 010 and 111 for students currently enrolled in math. Additionally, courses designed to provide the first two years of Mathematics degree as well as support courses for many science and Engineering pathways are offered up to and including Differential Equations. These courses are a cluster of eleven college level math courses that transfer to all three state universities. There are six one hundred level courses and five two hundred level courses. For Associate of Arts degrees, one math course is needed for graduation and the requirement is MAT 140/142-College Mathematics or higher. For Associate of Science degrees, MAT 220-Calculus I is the minimum requirement for graduation. For the ABUS degree, MAT 211 –Business Calculus is the required course for graduation. Additionally, eight of our 27 certificates have a required math course or have courses with math prerequisites in them.

At first glance, our mathematics program may seem like any other community college math program in the state. However, as a department, we have always strived to offer the most current course content recognized nationally, incorporating varied delivery methods and pedagogy, and applying the Best Practices of our national mathematics organizations. This dedication to the cutting edge of math education is evidenced by the active participation of our faculty throughout the existence of the college. Full-time faculty are involved in national, regional, and local mathematics organizations, initiatives, businesses, and consortiums.

A few of the ways that the program gathers input is by this active participation in numerous organizations, companies, and groups. Recent participation (within the last 5 years) includes but is not limited to:

- American Mathematical Association of Two Year Colleges (AMATYC) Kate Kozak is currently a regional Vice President and is running for president of this national organization. In addition, she has been the national newsletter editor.
- Arizona Mathematical Association of two year colleges (ArizMATYC) Jennifer Jameson is currently the Arizmatyc treasurer and has been for the last two years. Additionally, multiple full-time faculty have held various leadership positions in this organization including president, secretary, newsletter editor, and delegate.
- FUSD/CCC/NAU Consortium. This group is a local organization that discusses issues relating to helping students transition between High School, Community College and the University. This group started in 2014. Multiple full-time faculty participate in this group on a regular basis.

- Noyce Grant. Kim Sonier has taken the lead on this in collaboration with NAU. This grant encourages students to become STEM content educators.
- Indigenous Studies Grant. Maxie Inigo and Bryan Bates participated in this grant for two years and developed curriculum design specifically for Native American students. Course were taught in collaboration with the NAU Indigenous studies program.
- Sustaining Quantitative Reasoning in Arizona Grant. Jennifer Jameson participated in a statewide grant sponsored through NAU that helped develop materials for the MAT 140/142 courses with community colleges and high schools.
- NSF StatPREP Grant - Kate Kozak is a co-PI on this grant is to train community college and university statistics teachers to teach statistics utilizing data centric methods of statistical analysis.
- MyMathLab. Maya Lanzetta developed and modified course shells including standardized homework for all CCC developmental math courses. She maintained the integrity of course content and brought the developmental pedagogy into the new millennium. She works closely with the Pearson publishing company.
- Open Source textbooks. The department utilizes two open source textbooks written by full-time faculty members: Statistics Using Technology written by Kate Kozak and College Mathematics for Everyday Life written by Inigo, Jameson, Kozak, Lanzetta, and Sonier. These textbooks save our students hundreds of dollars each semester in addition to providing curricula that is current and relevant locally.
- MyOpenMath. The free math software is utilized in multiple courses. Maya Lanzetta and Phil Martinez have begun to use this instead of MyMathLab in some developmental courses in an effort to save students money while providing sound and appropriate content. Additionally, this program is used in the MAT 140 course to deliver the Intermediate Algebra content (developed by Jennifer Jameson and Kate Kozak)
- HAWKES Learning. Phil Martinez and Maya Lanzetta are piloting this software in Intermediate Algebra. HAWKES is another publishing company.
- Supplemental Instruction. This program began in collaboration with NAU in 2010. It has evolved into a very beneficial student support structure. Phil Martinez has managed this program for the past few years and expanded it to its current state. It is free to our students and offers a one-on-one support system that other tutoring structures have not duplicated. Phil collaborates with internal and external student support departments.

As you can see, the math department takes great pride in providing a math program that is exemplary. Faculty in our department take the education of our students seriously.

Changes since the last program review in 2012 are many. A major program change is the elimination of a mathematics department chair position. The department still has regular meetings and has divided up the chair workload among full-time faculty with the exception of hiring part-time faculty. Math faculty regularly volunteer on hiring committees but do not have final input on new hires in the department. Distribution of departmental guidelines, CANVAS math course access, and standardized materials is still being worked on and a process for consistent distribution is in development.

Numerous curricular and pedagogical changes have also been made in an effort to provide a streamlined curricula in keeping with national trends, provide students with affordable textbooks and course materials, and deliver cutting edge strategies to support students and their learning.

b. Program goals

In past program reviews, the math department employed two mission statements:

1. The CCC Developmental Math Program provides a sequence of math course for those students needing review of pre-college level topics. The mission statement is:

"To ensure that students may enter college level courses with the skills necessary for success by increasing their mastery of prerequisite mathematics skills and encouraging a positive attitude towards mathematics."

2. The mission statement for the Transfer Math Program is similar to the one for the developmental math program and is as follows.

"To ensure that students exit college level courses with the competencies necessary for success by increasing their mastery of mathematics skills and encouraging a positive attitude towards mathematics."

These mission statements clearly illustrate our goals to deliver a program that;

1. Provides students with the opportunity to increase mastery of developmental math skills.
2. Encourages the development of a positive and practical attitude towards mathematics.
3. Provide the opportunity for students to exit CCC with mastery of mathematics skills necessary for them to succeed in their next endeavor.
4. Provide an economical and cutting edge program with which to accomplish the previous goals.

It is self-evident that these goals support the college's mission: *As a learning college, we enrich lives by embracing diversity and transforming the future through quality education.*

The math department embraces the learning college concept because each member takes responsibility for making the program better through collegial engagement, collaboration, participation, and communication within our department, college-wide, locally and nationally.

c. Staffing of the program

Currently, the CCC math department has seven full-time math faculty, 12 part-time math faculty, and three supplemental instructors. Part-time math faculty are hired by the AOC's in collaboration with the Dean and full-time faculty that are able to participate. In the past year, the Credentialing Committee has created guidelines for qualifications for hiring faculty that has begun implementation Fall 2017.

The supervisor of the math faculty is the Dean of Learning Arts and Sciences. Faculty mentors are there to help new part-time math faculty. Supplemental instruction employees are hired by a full-time faculty person.

d. Decision Making

The mathematics program has been in existence since the creation of the college in 1992. From its inception, the department has made decisions using the consensus model. We have semi-monthly department meetings and there is frequent communication between the faculty, part-time faculty, and the dean.

The last program review was submitted in 2012 with participation from institutional research and math department. It examined the transfer level mathematics program. Changes since the last program review include:

1. Elimination of Math department chair
2. Elimination of the full-time math faculty position on the Page campus. The faculty member was transferred to the Lone Tree campus to teach math.
3. Creation of a new full-time math faculty position on the Lone Tree campus that was filled Fall 17.
4. Review of all course outlines with regard to Assessment of course outcomes
5. Review and modification of MAT 140/142 course outcomes
6. Alignment of General Education math course outcomes with General Education program outcomes
7. Development of open source textbooks to help students financially
8. Implementation of MyMathLab, MyOpenMath, and other online math software programs for student homework and/or course content delivery
9. Modification of developmental math sequence and courses including combining two courses to create MAT 088, combining two courses to create MAT 140 to reflect best practices nationwide.
10. Continual improvement of course content, program alignment, course transfer and offerings via participation in Math Articulation Task Force (ATF)
11. Continual improvement of support materials for full and part-time math faculty including the creation of a CANVAS shell with the following documents for each course.
    a. Chapter coverage
    b. Grading guidelines
    c. Course outline
    d. Sample syllabi
    e. Sample calendar
    f. Instructions for MyMathLab, MyOpenMath, Hawkes, Graphing Calculator, or other technical support
12. Continual improvement of communication by posting minutes and other important information in the CANVAS shell.
13. Improvement of assessment reporting through CANVAS
14. Participation in various math grants to improve pedagogy
15. Participation in various grants to improve STEM student participation in STEM professions and education
16. Additional participation in local STEM organization like STEM night at NAU, Science in the Park, and CCC night for the Festival of Science.
17. Participation in local, regional and national math organizations to improve our program. (this has been ongoing but there are a few new collaborations)

18. Discontinuation of the NAU/CCC developmental Math program. CCC taught the Introductory and Intermediate Algebra course for NAU students on the NAU campus from 1992-Spring 2013. NAU discontinued the program because they implemented a computerized course delivering the developmental content. CCC faculty helped them develop this new course.
19. Integrated the statistical software R into the Introduction to Statistics classes to give students experience with software that is used in many fields.
20. Integrated the programming platform MATLAB into Differential Equations and Introduction to Programming for Scientists and Engineers to give students experience with software that is used in engineering, math and the sciences.

Although there are no agencies that dictate how we should organize, design, implement and assess our program, we gather as much input from resources throughout the nation to provide information for success. These organizations have been mentioned previously.

e. Summary of student assessment results
See assessment section below.

f. Statement of program's accomplishments in support of the current strategic plan
The Math department has supported the current Strategic Goals in the following ways.

Goal 2: CCC will promote a learner-centered environment that incorporates innovative strategies and support structures intended to reduce student attrition and increase retention.
1. We have produced and utilized affordable course materials
2. We have reduced the number of developmental courses need for students to complete degree requirements
3. We have continued collaboration and participation in Math ATF, university math departments, and our National organizations to provide course content that is relevant and practical for student to complete degrees.

Goal 3: CCC will empower students to achieve their individual learning goals and implement strategies to increase certificate and degree completion rates.

1. We have produced and utilized affordable course materials
2. We have reduced the number of developmental courses need for students to complete degree requirements
3. We have implemented on-line homework so students can receive immediate feedback and take control of their own learning.

Goal 4: CCC will strengthen the College's working environment by maximizing college resources, expanding community outreach, and implementing effective personnel management and employee development strategies.
1. We have developed a collaborative solution to the reduced leadership and personnel in our department through creative management and faculty participation.

2. We have developed and implemented ways for faculty and employees to access and share information created by the math department.
3. We participate in local, regional, and national organizations to improve communication, course content, pedagogy, and collaboration using the Learning College model.

g. Description of current facilities needed to conduct program, including space and equipment

Designated math classrooms include, but are not limited to, rooms 107, 460, 509, and 518 on the Lone Tree campus and rm B 34 on the 4th St campus

Rooms 460 and 509 are best suited for the needs of our math faculty. They include ample white board space, a Cartesian coordinate system whiteboard, an overhead projector and a smart board. They are also large rooms that can accommodate the most students. With the exception of the occasional excessive noise from an adjacent class in room 509, these two rooms are the best suited for our needs.

Room 518 is small, has two large white boards that are largely covered by the projector screen if the projector is in use. There is currently no smart board nor Cartesian plane in this room, but it could use them. This room also has noise issues from adjacent classrooms. A Cartesian whiteboard was added to the classroom. It needs to be moved to the front of the classroom.

Mobile chair desks, which easily allow the students to move their desks into groups, may be useful in room 518 as it is the classroom most often utilized by the department for developmental math classes. Room 460 would also be a good candidate for these desks due to the side whiteboards being more useful than the ones in the front of the classroom.

Room 107 has two large white boards, an overhead projector screen in the corner and a smartboard. The room is a little bit smaller and is used as a computer classroom. Due to the computers on the desks in front of each student it can be difficult to see the lower half of the boards in the front of the room. A platform in front of the room in 107 would allow access to the upper quarter of the white boards and would be a recommended addition to the room. The computers are helpful in MAT 241, 160, and 140 as they use the computers readily during class time. A Cartesian plane whiteboard will be added to this room soon.

Rm B34 on the 4th St. campus is a large tiered classroom that can accommodate at least 40 students. It has 2 large white boards that are covered by the projector screen if the projector is in use. It doesn't have a Cartesian plane or a smart board.

The Cartesian planes were recently purchased and are very useful as we develop lessons that pertain to graphing.

The smart boards are used by many of the faculty as a way to deliver lecture notes to students who need that accommodation and for students who may have been absent or just need the refresher.

White boards are critical in math classrooms as the intensive algebra development of our lessons can take up 2 or 3 boards at once.

All of the designated math classrooms on the Lone Tree campus have graphing calculator software on our computers to project step-by-step use of the graphing calculators in class.

Other classrooms used by the math department suffice in a pinch, but often lack the Cartesian planes, board space, or smart boards that have become more commonly used by our math faculty.

Due to the use of computers in MAT 261, 241, 160 and 140 and the number of sections of each course, we would also like to consider the addition of another computer room for use by the math faculty.

II. TEACHING AND LEARNING

a. Program requirements and course offerings

i. List of courses and their descriptions

Mathematics (MAT)

Last Updated: 08 November 2016

*Shared Unique Number System (SUN) is a statewide course numbering system designed to help Arizona students plan their education and ensure successful transfer of course credits.

MAT 010

Math Help- 911 (2)

Small group supplemental instruction in math and study skills development. Co-requisite: *MAT 082 or *MAT 086 or *MAT 091 or *MAT 096 or *MAT 097. Must be taken for S/U grading. Two lecture.

MAT 088 (4)

Pre-Algebra

Arithmetic concepts with integers, fractions, and decimals, including signed numbers.

Solving linear equations and evaluating algebraic expressions. Prerequisite: Placement. Four lecture. Fall, Spring.

For previous students, this course replaces/combines MAT 082 and MAT 086.

MAT 091 (4)

Beginning Algebra

Basic algebraic concepts including operations with signed numbers, exponents and radicals,

linear equations and inequalities, polynomials, and graphing. Prerequisite: MAT 088 or placement. Four lecture. Fall, Spring.

For previous students, the prerequisite would be completion of MAT 086 with a grade of C or better.

MAT 096 (previously MAT 122) (3) Beginning Fall 2017, this course will no longer be offered.

Intermediate Mathematics

Basic algebraic concepts, including rational expressions, functions and their graphs, radicals, quadratics, and logarithms/exponentials. Prerequisite: *MAT 091 or placement beyond prerequisite. Three lecture.

MAT 097 (previously MAT 121) (4)

Intermediate Algebra

Basic algebraic concepts, including rational expressions, functions and their graphs, radicals, quadratics, and logarithms/exponentials. Prerequisite *MAT 091 or placement beyond prerequisite. Four lecture.

MAT 111 (2)
Math Help 411
Small group supplemental instruction in math and study skills development. Co-requisite: *BUS 232 or *MAT 140 or *MAT 142 or *MAT 151 or *MAT 160 or *MAT 172 or *MAT 180 or *MAT 181 or *MAT 187. Two lecture. Must be taken for S/U grading.

MAT 140 (5)
College Mathematics with Algebra Review
Students will examine finance, growth, probability, statistics, and common applications encountered in society. Review material will be taught just in time for when it is needed. General Education: Mathematics. Prerequisite: *MAT 091 or placement into MAT 096 or MAT 097 or 140. Five lecture.

*NOTE: For those students who have passed MAT 097 (MAT 121) or MAT 096 (MAT 122), you should opt to take MAT 142 or higher based on your program requirements. MAT 140 combines (MAT 096 (MAT 122) and MAT 142, so you will be repeating content if you register for MAT 140.

MAT 142 (3)
College Mathematics
Students will examine finance, growth, probability, statistics, and common applications encountered in society. General Education: Mathematics. Prerequisite: *MAT 096 (MAT 122) or MAT 097 (MAT 121) or placement beyond prerequisite. Three lecture.

MAT 151 (4)
SUN# MAT 1151
College Algebra
College level algebra, including equations, functions, matrices, inequalities, sequences and series, and fundamental algebra theorems will be studied. Prerequisite: MAT 096 (MAT 122) or MAT 097 (MAT 122) or placement beyond prerequisite. MAT 097 (MAT 121) is recommended over MAT 096 (MAT 122), however, completion of either course or placement beyond these courses is required. General Education: Mathematics. Four lecture. Fall.

MAT 160 (3)
SUN # MAT 1160
Introduction to Statistics
Statistical tools and techniques used in research and general applications. Includes descriptive statistics, probability and probability distributions, point and interval estimates of population parameters, hypothesis testing, and correlation and regression. Prerequisite: *MAT 140 or placement beyond prerequisite. General Education: Mathematics. Three lecture.

MAT 172 (3)
Finite Mathematics
Various analytical methods used in business and social sciences, including algebra review, functions and modeling, systems of linear equations, matrices, linear programming, mathematics of finance, probability, and combinations. Prerequisite: *MAT 151 or placement beyond prerequisite. Three lecture.

MAT 180 (3) Beginning Fall 2016, this course was no longer offered.
Mathematics for the Elementary Teacher I
Mathematical foundations of elementary school mathematics curriculum. including problem solving, principles of whole numbers, integers, rational numbers, ratios, proportions and percentages. Emphasizes the use of models and manipulatives to increase understanding of the mathematical concepts. Prerequisite: *MAT 096 (MAT 122) or MAT 097 (MAT 122) or placement beyond prerequisite. Three lecture.

MAT 181 (3) Beginning Fall 2016, this course was no longer offered.
Mathematics for the Elementary Teacher II
Mathematical foundations of the elementary school mathematics curriculum including measurement, geometry, probability, and statistics. Emphasizes the use of models and manipulatives to increase understanding of the mathematical concepts. Prerequisite: *MAT 180. Three lecture.

MAT 187 (5)
SUN # MAT 1187
Pre-Calculus
College level algebra and trigonometric topics to prepare for calculus. Functions, equations, and inequalities, trigonometry, and fundamental algebra theorems will be studied. General Education: Mathematics. Prerequisite: *MAT 097 (MAT 121) or *MAT 151 or placement into MAT 187 course. Five lecture.

MAT 211 (4)
SUN # MAT 2212
Business Calculus
Integral and differential calculus, including multidimensional, with business and social science applications. General Education: Mathematics. Prerequisite: MAT 151 or placement beyond prerequisite. General Education: Mathematics. Four lecture. Spring.

MAT 220 (5)
SUN # MAT 2220
Calculus & Analytic Geometry I
Limits, continuity, differential, and integral operations on algebraic and trigonometric functions and applications. Prerequisite: *MAT 187 or placement beyond prerequisite. General Education: Mathematics. Five lecture.

MAT 230 (5)
SUN # MAT 2230
Calculus & Analytic Geometry II
Applications and methods of integration, Taylor polynomials and series, differential equations, multivariable functions and vectors. Prerequisite: *MAT 220. General Education: Mathematics. Five lecture.

MAT 241 (4)
SUN # MAT 2241
Calculus & Analytic Geometry III
Multidimensional calculus. Includes conic sections, polar coordinates, partial derivatives, gradients, directional derivatives, extrema, multiple and iterated integrals, vector calculus, line integrals, and Green's Theorem. Prerequisite: *MAT 230. General Education: Mathematics. Four lecture.

MAT 261 (4)
SUN # MAT 2262
Differential Equations
Introduction to ordinary differential equations. Includes first order equations, higher order linear equations, applications of first and second order equations, series solutions, Laplace transforms, and systems of linear differential equations. General Education: Mathematics. Prerequisite: *MAT 230. Four lecture.

MAT 298 (1–6)
Special Topics
Designed to meet the needs of an individual(s) who has an interest in pursuing an original topic in an instructional area under faculty supervision. One to six variable credit hours.
*Course has additional pre or corequisite(s)

ii. List of degrees and certificates
Degrees and Certificates
Last Updated: 18 August 2016

The Degrees & Certificate programs offered at Coconino Community College are a diverse and comprehensive line of study, laying the groundwork for a bright and successful future for any students attending CCC. Listed below is a complete list of all degrees and certificates available here at CCC.

Degrees

Associate Degrees (AA)	REQUIRED	ELECTIVE
Administration of Justice	MAT 140 or higher	
Anthropology	MAT 140 or higher	MAT 160
Business	MAT 140 or higher, 172	
Colorado Plateau Studies	MAT 140 or higher	
Construction Technology Management	MAT 187 or higher, 160	
Environmental Studies	MAT 140 or higher	
General Studies	MAT 140 or higher	
Hotel and Restaurant Management	MAT 140 or higher	
Psychology	MAT 140 or higher	
Sociology	MAT 140 or higher	
Vocational Technology Education	MAT 140 or higher	

Associate in Applied Science Degrees (AAS)	REQUIRED	ELECTIVE
Administration of Justice	MAT 140 or higher	
American Sign Language (ASL) Interpreting	MAT 140 or higher	
Business	MAT 140 or higher	
Computer Software Technology	MAT 140 or higher	
Construction Technology	MAT 140 or higher	
Environmental Technology: Alternative Energy Technician	MAT 140 or higher	
Fire Science	MAT 140 or higher	

Hospitality Management	MAT 097 or higher	
Medical Office Management	MAT 140 or higher	
Network Engineering	MAT 140 or higher	
Nursing	MAT 140 or higher	
Paramedic Studies	MAT 140 or higher	
Pre-Health Careers	MAT 140 or higher	
Sustainable Green Building	MAT 140 or higher	

Associate of Business Degree (ABus)	REQUIRED	ELECTIVE
Associate of Business	MAT 211 or higher, 172	

Associate of Fine Arts Degree (AFA)	REQUIRED	ELECTIVE
Visual Arts	MAT 140 or higher	

Associate of General Studies Degree (AGS)	REQUIRED	ELECTIVE
Associate of General Studies	MAT 140 or higher	

Associate of Science Degree (AS)	REQUIRED	ELECTIVE
General Studies	MAT 220 or higher	MAT 230 or higher

Certificates

*Complete GE information per 34 CFR 668.6 can be found by clicking on each certificate designated with a *. Also, * certificates are eligible for Federal Financial Aid.*

Certificates	REQUIRED	ELECTIVE
Accounting*		
AGEC-A	MAT 140 or higher	
AGEC-B	MAT 211 or higher	
AGEC-S	MAT 220 or higher	
Construction Technology*	MAT 187 or higher	
Environmental Technology: Alternative Energy	MAT 096, 097, or higher	
Phlebotomy	MAT 091 or higher	
Pre-Health Careers	MAT 140 or higher	

iii. Enrollment as of Day 10 for each semester

2011-2016 MAT 10 Day Enrollments by Semester

SUBJECT	CRSE	SECTION	201180	201210	201268	201280	201310	201368	201380	201410
MAT	010	1	13							
MAT	010	2	13	15		15	11		15	12
MAT	082	1	21	23	9	22	23	8	25	28
MAT	082	2	22	23		26	14		25	23
MAT	082	3	18			25			18	20
MAT	082	4	24			24			24	6
MAT	082	5	20	25			23		8	
MAT	082	21	6	5		7	9			
MAT	086	1	21	21		32	23		15	24
MAT	086	2	23	15	14		15	20	20	11
MAT	086	3		22		26	24		14	17
MAT	086	4	20	12			14			14
MAT	086	5								2
MAT	086	6	25							
MAT	086	21	9	7			7		3	
MAT	091	1	30	30		34	29	16	31	30
MAT	091	2	32	38	10	31	31		31	22
MAT	091	3	25	33	8	23	29	13	29	20
MAT	091	4	27	30		29	30		32	26
MAT	091	5	26	25		25	25		24	27
MAT	091	6	30	24		26	22		27	20
MAT	091	7	27			24			27	7
MAT	091	8				17			27	
MAT	091	9							8	
MAT	091	21	9	19		23	11	5		
MAT	091	22	11							
MAT	091	XLST			12					
MAT	121	1	35	24	8	37	30	13	35	30
MAT	121	2	35	30		36	29		19	26
MAT	121	3	35	17	10	24	16	11	32	18
MAT	121	4	39	27		35	28		23	29
MAT	121	5	36		15				9	
MAT	121	6	25							
MAT	121	7	35							
MAT	121	8	32							
MAT	121	21	14	10		6	8			
MAT	121	22	7							
MAT	122	1		22	14	24	24	18	25	23
MAT	122	2		27	11	24	26		25	24
MAT	122	3		27			30	15	30	32
MAT	122	4		14	5	30	26		31	25
MAT	122	5		29		30	26		32	31
MAT	122	6		22		22			30	20
MAT	122	7				24	20		21	20
MAT	122	8		15					16	

MAT	122	9							26	
MAT	122	21		14		9	16	3		
MAT	122	XLST				20	20			
MAT	140	1							19	22
MAT	140	2							20	19
MAT	140	3								
MAT	142	1	36	24	20	14	24	15	40	28
MAT	142	2		29	15	30	26	20	33	
MAT	142	3	21	28	23	22	20	11	29	30
MAT	142	4			8		33		33	23
MAT	142	5				29	32		34	19
MAT	142	6	21	11		15	22		30	28
MAT	142	7		24		20	26		14	36
MAT	142	8	26	22		25	23			35
MAT	142	9	26	13			33			15
MAT	142	10	25	33						
MAT	142	11	18							
MAT	142	21	23	15		22	8			
MAT	142	XLST		21		28				
MAT	151	1	25							
MAT	151	2	25							
MAT	172	1	11	30	19	17	15	19	18	29
MAT	172	2	27			28			31	
MAT	180	1				14				5
MAT	180	XLST	18							
MAT	181	1	1				8			
MAT	181	2								4
MAT	181	XLST		12						
MAT	187	1	34	36	24	35	32	16	40	37
MAT	187	2	22	34	6	44	34	18	40	36
MAT	187	3	34	15		37	35		42	34
MAT	187	4								
MAT	187	5								
MAT	187	13								
MAT	187	23					8			
MAT	220	1		27	14	38	45	22	36	35
MAT	220	2	38							22
MAT	230	1	24	33		15	17		21	26
MAT	241	1	12			18			9	
MAT	261	1		10			14			14

SUBJECT	CRSE	201468	201480	201510	201568	201580	201610	201668	Grand Total
MAT	010					5	7		25
MAT	010								81
MAT	082	12	26			25			222
MAT	082		23	11		23			190
MAT	082		24	25		26	27		183
MAT	082			8			16		102
MAT	082								76
MAT	082								27
MAT	086		25			27	17		205
MAT	086	17	20	10		18			183
MAT	086		19	20		24	16		182
MAT	086			11			8		79
MAT	086			28					30
MAT	086								25
MAT	086								26
MAT	091	8	31	25	25	25	26	14	354
MAT	091	17	34	22	13	29	26	12	348
MAT	091	8	32	28		27	25		300
MAT	091		28	26		24	26		278
MAT	091		30	18		28	20		248
MAT	091		25	11		26	22		233
MAT	091		23	25		26	24		183
MAT	091		29	5		25	5		108
MAT	091		8			7			23
MAT	091								67
MAT	091								11
MAT	091								12
MAT	121	11	38	29	12	30	32	15	379
MAT	121		28	29		28	27		287
MAT	121		34	10		33	11		251
MAT	121		25	21		29	28		284
MAT	121			0					60
MAT	121								25
MAT	121								35
MAT	121								32
MAT	121								38
MAT	121								7
MAT	122	9	27	20		26	19		251
MAT	122	9	30	33	10	29	23	16	287
MAT	122	10	30	32	12	29	30	10	287
MAT	122		32	9		24	16		212
MAT	122		15			18	13		194
MAT	122		18	6		20	11		149
MAT	122		16	22		14	27		164
MAT	122		10			30			71

MAT	122			16					42
MAT	122								42
MAT	122								40
MAT	140	15	24	23	23	28	25	26	205
MAT	140		27	25		26	26		143
MAT	140		24	16		23	24		87
MAT	142	16	22	32	16	19	22	13	341
MAT	142	24	37		16	29	28	11	298
MAT	142		29	35	11	31	34	14	338
MAT	142	15	21	33		28	21		215
MAT	142		11	14		17	17		173
MAT	142		24	25		26	26		228
MAT	142		36	29		26	23		234
MAT	142		9	21		13	8		182
MAT	142		10	10		2			109
MAT	142								58
MAT	142								18
MAT	142								68
MAT	142								49
MAT	151								25
MAT	151								25
MAT	172	19	18	25	24	14	21	27	306
MAT	172		19			30	18		153
MAT	180		15			11	1		46
MAT	180								18
MAT	181			8			8		25
MAT	181								4
MAT	181								12
MAT	187	17	37	34	23	36	28	15	444
MAT	187	15	38	31	16	20	30	11	395
MAT	187			26		35	14		272
MAT	187		38	30		34	29		131
MAT	187					6	23		29
MAT	187						0		0
MAT	187								8
MAT	220	19	29	29	22	29	32	21	398
MAT	220		20	16		22	16		134
MAT	230	0	27	26	10	29	33		261
MAT	241		15			22			76
MAT	261			18			27		83

iv. List of courses, number of sections, number of enrollments, tuition paid by fiscal year

		2011-2012				2012-2013				2013-2014			
		SECTIONS	ENROLLMENT	TUITION	FEES	SECTIONS	ENROLLMENT	TUITION	FEES	SECTIONS	ENROLLMENT	TUITION	FEES
MAT	10	4	62	$ 10,292.00	$1,860.00	10	48	$ 8,160.00	$1,440.00	10	56	$ 9,744.00	$1,680.00
MAT	82	12	206	$ 51,294.00	$ -	8	184	$ 46,920.00	$ -	10	192	$ 50,112.00	$ -
MAT	86	12	196	$ 48,804.00	$ -	19	161	$ 41,055.00	$ -	19	141	$ 36,801.00	$ -
MAT	91	20	461	$153,052.00	$ -	2	452	$153,680.00	$ -	2	423	$ 147,204.00	$ -
MAT	111	1	1	$ 166.00	$ 30.00	12	5	$ 850.00	$ 150.00	11	5	$ 870.00	$ 150.00
MAT	121	19	468	$155,376.00	$ -	22	276	$ 93,840.00	$ -	19	239	$ 83,172.00	$ -
MAT	122	11	208	$ 51,792.00	$ -		435	$110,925.00	$ -	5	440	$ 114,840.00	$ -
MAT	140					26				22	95	$ 41,325.00	$ -
MAT	142	26	531	$132,219.00	$ -		561	$143,055.00	$ -		533	$ 139,113.00	$ -
MAT	151	3	55	$ 18,260.00	$ -	8				7			
MAT	160	10	157	$ 39,093.00	$ -	4	119	$ 30,345.00	$ -	4	118	$ 30,798.00	$ -
MAT	172	4	89	$ 22,161.00	$ -	1	88	$ 22,440.00	$ -	1	102	$ 26,622.00	$ -
MAT	180	2	19	$ 4,731.00	$ -	1	15	$ 3,825.00	$ -	1	5	$ 1,305.00	$ -
MAT	181	3	14	$ 3,486.00	$ -	13	8	$ 2,040.00	$ -	11	6	$ 1,566.00	$ -
MAT	187	11	229	$ 95,035.00	$ -	4	308	$130,900.00	$ -	5	303	$ 131,805.00	$ -
MAT	220	3	77	$ 31,955.00	$ -	2	108	$ 45,900.00	$ -	2	118	$ 51,330.00	$ -
MAT	230	2	56	$ 23,240.00	$ -	1	34	$ 14,450.00	$ -	1	47	$ 20,445.00	$ -
MAT	241	1	12	$ 3,984.00	$ -	1	18	$ 6,120.00	$ -	1	9	$ 3,132.00	$ -
MAT	261	1	10	$ 3,320.00	$ -		14	$ 4,760.00	$ -		13	$ 4,524.00	$ -
	Grand Tota	145	2851	$848,260.00	$1,890.00		2834	$859,265.00	$1,590.00		2845	$ 894,708.00	$1,830.00

		2014-2015				2015-2016				Totals			
		SECTIONS	ENROLLMENT	TUITION	FEES	SECTIONS	ENROLLMENT	TUITION	FEES	SECTIONS	ENROLLMENT	TUITION	FEES
MAT	10	6	22	$ 3,916.00	$ 660.00	5	12	$ 2,208.00	$ 360.00	35	200	$ 34,320.00	$6,000.00
MAT	82	8	116	$ 30,972.00	$ -	6	117	$ 32,292.00	$ -	44	815	$ 211,590.00	$ -
MAT	86	19	140	$ 37,380.00	$ -	19	107	$ 29,532.00	$ -	88	745	$ 193,572.00	$ -
MAT	91	2	440	$156,640.00	$ -		416	$153,088.00	$ -	26	2192	$ 763,664.00	$ -
MAT	111	10	3	$ 534.00	$ 90.00	9				43	14	$ 2,420.00	$ 420.00
MAT	121	17	227	$ 80,812.00	$ -	17	231	$ 85,008.00	$ -	94	1441	$ 498,208.00	$ -
MAT	122	7	346	$ 92,382.00	$ -	7	358	$ 98,808.00	$ -	30	1787	$ 468,747.00	$ -
MAT	140	20	162	$ 72,090.00	$ -	20	178	$ 81,880.00	$ -	88	435	$ 195,295.00	$ -
MAT	142		444	$118,548.00	$ -		410	$113,160.00	$ -	26	2479	$ 646,095.00	$ -
MAT	151	9				10				37	55	$ 18,260.00	$ -
MAT	160	4	151	$ 40,317.00	$ -	5	155	$ 42,780.00	$ -	27	700	$ 183,333.00	$ -
MAT	172	1	88	$ 23,496.00	$ -	2	115	$ 31,740.00	$ -	9	482	$ 126,459.00	$ -
MAT	180	1	15	$ 4,005.00	$ -	1	12	$ 3,312.00	$ -	6	66	$ 17,178.00	$ -
MAT	181	9	8	$ 2,136.00	$ -	13	8	$ 2,208.00	$ -	49	44	$ 11,436.00	$ -
MAT	187	5	271	$120,595.00	$ -	5	287	$132,020.00	$ -	30	1398	$ 610,355.00	$ -
MAT	220	3	116	$ 51,620.00	$ -	2	121	$ 55,660.00	$ -	12	540	$ 236,465.00	$ -
MAT	230	1	61	$ 27,145.00	$ -	1	61	$ 28,060.00	$ -	6	259	$ 113,340.00	$ -
MAT	241	1	15	$ 5,340.00	$ -	1	22	$ 8,096.00	$ -	5	76	$ 26,672.00	$ -
MAT	261		18	$ 6,408.00	$ -		27	$ 9,936.00	$ -	1	82	$ 28,948.00	$ -
	Grand Total		2643	$874,336.00	$ 750.00		2637	$909,788.00	$ 360.00		13810	$4,386,357.00	$6,420.00

b. Licensure for students

Not applicable.

c. Course outlines reviewed and updated

Course Outlines

i. Schedule for review

Course outlines are scheduled to be reviewed at least every five years.

Course	Last Reviewed	Scheduled Review
MAT 010	2013	2018
MAT 088	2015	2020
MAT 091	2015	2020
MAT 097	2016	2021
MAT 111	2010	2015
MAT 140	2015	2020
MAT 142	2014	2019
MAT 151	2015	2020
MAT 160	2015	2020
MAT 172	2014	2019
MAT 187	2015	2020
MAT 211	2016	2021
MAT 220	2014	2019
MAT 230	2014	2019
MAT 241	2014	2019
MAT 261	2014	2019

In 2014 Dean Ingrid Lee requested that the math department go through and review all course outlines that had not been reviewed in the last five years. The math department fully completed this request in 2014. While creating this document the math department found that this review in 2014 was not reflected on the publicly posted course outlines. To rectify this, the math department has re-reviewed MAT 111, MAT 220, MAT 230, and MAT 241. A note that the courses have been reviewed will be added to the top of the course outlines. MAT 142 and MAT 172 have had changes to the course

outline that have been passed through curriculum in FA16/SP17 so the review date being added to the posted outline is pending.

ii. Changes to course outcomes

MAT 091/MAT 096/MAT 097

A different edition of the textbook for these three classes was adopted in 2014 which included a rearranging of sections. Most of these course outcome changes are due to this rearrangement of the book.

MAT 091: "Verify solutions to algebraic expressions" and "Use interval notation to describe solutions to inequalities" were added to course outcomes.

MAT 096 / MAT 097: "Perform function evaluation and identify domain and range" and "Perform operations on functions including finding the inverse" were added. "Graph linear inequalities in 2 dimensions" and "Solve and graph absolute value equations" were removed.

The effect of the changes to MAT 091 / MAT 096 / MAT 097 has been to improve the continuity of the courses. Otherwise, these changes have had no effect on the program as a whole.

MAT 140

MAT 140 was created within the last five years. It was created to include all of the curriculum from MAT 142, College Mathematics, and also include remedial material from MAT 096, Intermediate Algebra. This way, students could complete both the developmental and the college level
classes at once and save time and money. The class has been successful as shown below in its success rates. The success rates in MAT 140 are actually higher than those of MAT 142 over the last several years. The Mathematics ATF agreed to articulate MAT 140 as a transfer course equivalent with MAT 142. The class is very popular with the students as well.

MAT 142

The MAT 142 course outcomes were updated to more clearly represent the statewide agreed curriculum for that course. The agreed upon topics have not changed, but the outcomes were re-worded in 2016 to be more clear and to better communicate to the students what they will be learning in the course. This change has been helpful with teacher and student clarity about what the course entails, but the actual content of the course has not changed in the last five years.

MAT 187

Previously, polar, systems of inequalities, sequences and summation notation were required topics in MAT 187. The math department moved these topics to an optional category so that instructors would have the option to cover the arguably more important topics of vectors and matrices. MAT 187 is a prerequisite to physics courses. Additionally, the factor theorem and divisibility was added as Changes were added to the course outcomes to reflect the above changes in content.

The changes to MAT 187 were intended to potentially improve a student's readiness for physics while not sacrificing exposure to math topics beyond trigonometry. These changes have had no effect on the program as a whole.

MAT 172

In the fall of 2017, the course outcome "Solve non-linear systems by elementary row operations." was changed to "Solve linear systems by elementary row operations." to correct a clerical error.

MAT 261

MATLAB usage was added as a required element to MAT 261 to satisfy transfer to ASU.

This change to MAT 261 allows students to apply technology much more similar to what they would use in the work environment of the important field of differential equations. This shift to technology directs engineering students' attention to programming classes they will take in the future. This may increase student interest in taking EGR 122: Introduction to Programming for Scientists and Engineers at CCC.

d. Curriculum

i. New and retired courses since the last program review

Retired(Credits)[Last semester taught]	**Created(Credits)[First semester taught]**
MAT 082 Arithmetic(3) [FA15] MAT 086 Prealgebra(3)[FA15]	MAT 088 Pre-Algebra(4)[SP16]
MAT 122 Intermediate Mathematics(3)[SP17]	MAT 140 College Math W/Algebra Review(5)[SP 13]
MAT 180 Math for Elementary Teachers I(3)[SP15]	MAT 151 College Algebra(4)[FA16]
MAT 181 Math for Elementary Teachers II (3)[SP15]	

ii. Effects of curricular changes

A good deal of the curricular changes made were to address that students who spend a lot of time in a chain of developmental classes are more likely not to finish their college studies. To combat this, low level developmental courses are now only offered as fast track 8 week courses and some courses were combined to provide similar exposure to material in fewer semesters of study.

MAT 082/086/088

MAT 082/086 were retired and replaced with MAT 088 for the following reasons:

- Some members of the department did not feel that MAT 082/086 contained the optimal material for students to be successful in future math courses.
- MAT 088 is only taught in short 8-week sessions, so students placing in the lowest levels of developmental are given a shorter course chain to enter a college credit bearing course. MAT086 (8 week) and 091 (8 week) in one semester then MAT 140 will take a student two semesters to finish a liberal studies math requirement. Previously, students would take MAT 082, MAT 086, MAT 091, MAT 122, then MAT 142 which took five semesters.

- MAT 088 has free courseware and a lower number of credit hours, saving each student around $300.

MAT 088 success rate: 108 students, 68.5% successful (# successful / Beginning Enrollment [In-Person])
MAT 082/086 success rate: 2057 students, 72.3% successful (# successful / Beginning Enrollment [In-Person])

The slightly lower success rate in MAT 088 was predicted due to it being taught for the first time by instructors as well as it having a slightly faster pace. In one of the five sections offered so far, the success rate was over 30% lower than in the other four sections where the success rate was around 75%. A slightly lower success rate is offset by the benefits of the course.

MAT 122

In Spring 2017 the math department decided to not offer MAT 122 because MAT 140 completely fills its place in the non-STEM math track.

MAT 140

MAT 140, first taught in Spring 2013, was created to act both as the developmental MAT 122 and the college credit bearing MAT 142. It allows students to finish their liberal studies math requirement if they only need a little bit of remediation in one less semester than the previous chain MAT 122 then MAT 142. MAT 140 allows students to satisfy their general studies math requirement in less time.
MAT 140 success rate: 628 students, 73.6% successful (# successful / Beginning Enrollment [In-Person])
MAT 142 success rate: 2250 students, 68.4% successful (# successful / Beginning Enrollment [In-Person])
The success rate in MAT 140 is better than that of MAT 142 and both courses contain the same college level material. This, in addition to the time savings for students, indicate to the department that the MAT 140 course has been a success.

MAT 151

MAT 151, College Algebra had been taught before at CCC and was retired due to NAU not using College Algebra as a liberal studies foundations course, and the fact that the business department did not require business calculus. In 2015, the NAU math department informed the Math ATF of the following change. The NAU business department requested that the NAU math department create a course that incorporates topics from finite mathematics and business calculus. NAU math department started to offer this new course in 2016. To meet this requirement and to address the requirements of the ASU business college, which still has the more traditional sequence of business calculus and finite mathematics as separate course, business calculus was offered again. The prerequisite of business calculus is MAT 151, so the CCC math department unretired MAT151.

MAT 180/181

In 2013 the CCC District Governing Board came up with the Financial Austerity Plan in order to curb mounting budget concerns at the college. One element of this plan was to eliminate the education program of which MAT 180 and MAT 181 were a part. The two classes were offered for two years after this decision to serve those already in the program.

iii. Impending course changes

The math department is considering splitting MAT 187 – Precalculus into two pieces, one piece being a college algebra class and one piece that will contain trigonometry and perhaps extra topics such as vectors and matrices.

e. Articulation

In 1970, the Arizona Mathematics Consortium was created by an NSF grant with two goals in place. One was to created an organization to develop professional relationships between faculty at community colleges and universities, and the other was to aid in the flow of students between schools. The consortium become the Mathematics Articulation Task Force (ATF) with the creation of the ATF structure in the state. In the mid 1990s, the Mathematics ATF developed a common numbering system among mathematics courses taught at community colleges. After the common numbering system, the Mathematics ATF decided on a common core of classes that would be in all mathematics degrees. These are Calculus I, II, and III and Differential Equations. The concept of these courses, is if a student wishes to pursue a mathematics degree, then they need to take these four courses and they will satisfy the degree requirements at all mathematics degrees at any college or university in the state. After creating a common number system, there was an idea that we should agree on the content in some courses. So the ATF developed common content in the developmental sequence (agreed on what must be covered by the end of intermediate algebra), college algebra, precalculus, and college math (quantitative reasoning). Currently, the ATF is reviewing the content in these classes. The mathematics ATF has agreed on common CLEP and AP test scores for college credit. CCC mathematics faculty have been an active member of the ATF since the college was created in 1990. The current curriculum in the math department adheres to the common numbering and the common content, and CCC has adopted the cut scores on the CLEP and AP exams. CCC offers the common core of courses every year. The faculty are involved in the current content revision that the ATF is working on, and will modify curriculum of common mathematics courses if necessary in the future. Any courses suggested by the math department that do not reflect the requirements of common courses in the state are presented to the math ATF for input and approval. An example is MAT 140 that has a lower prerequisites than MAT 140 142?by incorporating the prerequisite material into the course. The concept of this course was presented to the ATF and received approval of all universities for transfer. The ATF structure provides a forum for discussion of curricular changes among community colleges and universities. The math faculty at CCC will continue to participate in the ATF, and make curricular changes based on suggestions from the ATF.

All courses are articulated to the universities and other community colleges via the ATF. The transfer agreements are housed at aztransfer.com in the Course Equivalency Guide. The course equivalency guide on April 10, 2017 showed these following equivalency.

Coconino Community College	ASU	NAU	UA
MAT 111 (2 credits) Math Help	Elective Credit	Non-transferable	Non-transferable
MAT 121 (4 credits) Intermediate Algebra			Math Developmental Elective
MAT 140 (5 credits) College Mathematics	MAT 142 and MAT Department Elective Mathematics (MA)	MAT 114; Foundation Requirement [FNRQ] NAU Personalized Learning: MAT 115; Foundation Requirement [FNRQ]	MATH 105
MAT 142 (3 credits) College Math	MAT 142, Mathematics (MA)	MAT 114; Foundation Requirement [FNRQ] NAU Personalized Learning: MAT115; Foundation Requirement [FNRQ]	MATH 105
MAT 151 (4 credits) College Algebra	MAT 117 & Elective Credit (1), Mathematics (MA)	MAT Departmental Elective; Foundation Requirement [FNRQ] – and – MAT 110; Foundation Requirement [FNRQ]	MATH 112 – and Math Department Elective

MAT 160 (3 credits) Intro to Statistics	STP 226 Computer/Stats (CS)	STA 270 Science & Applied Science [SAS] NAU Personalized Learning STAT 271; Science and Applied Science [SAS]	MATH 163
MAT 172 (3 credits) Finite Mathematics	MAT 119, Mathematics (MA)	MAT 119	MATH 114
MAT 172 (3) & MAT 211 (4) Finite Math/ Business Calculus	MAT 210 (3) & MAT 211(3) Elective Credit (1), Mathematics (MA)	MAT Departmental Elective – and MAT 131; Science & Applied Science [SAS – and – MAT 119	
MAT 180 (3 credits) Mathematics for Elementary Teacher 1	MTE 180		
MAT 181 (3 credits) Mathematics for Elementary Teacher II	MTE 181		
MAT 187 (5 credits) Pre-Calculus	MAT 170 (3) & Elective Credit (2), Mathematics (MA)	Elective Credit – and – MAT 125; Foundation Requirement [FNRQ]	MATH 120 R – and – MATH Dept Elective
MAT 211 (4 credits) Business Calculus	MAT 210 (3) & Elective Credit (1), Mathematics (MA)	MAT Departmental Electective – and – MAT 131; Science	MATH 116

		and Applied Science [SAS]	
MAT 220 (5 credits) Calculus and Analytic Geometry I	MAT 270 (4) & Elective Credit (1), Mathematics (MA) *Note: Will fulfill MAT 265 requirement for Engineering Majors.*	MAT 136; Science & applied Science [SAS	MATH 122B
MAT 230 (5 credits) Calculus & Analytic Geometry II	MAT 271 (4) & Elective Credit (1), Mathematics (MA)	MAT 137	MAT 129
MAT 241 (4 credits) Calculus & Analytic Geometry III	MAT 272, Mathematics (MA) Note: Will fulfill MAT 267 requirement for Engineering Majors.	MAT 238	MAT 223
MAT 261 (4 credits) Differential Equations	MAT 275(3) & MAT Dept Elective (1), Mathematics (MA)	MAT 239	MAT 254
MAT 298 (1) Special Topics	Non-Transferable	Elective Credit	MATH Dept Elective

f. Program accreditation

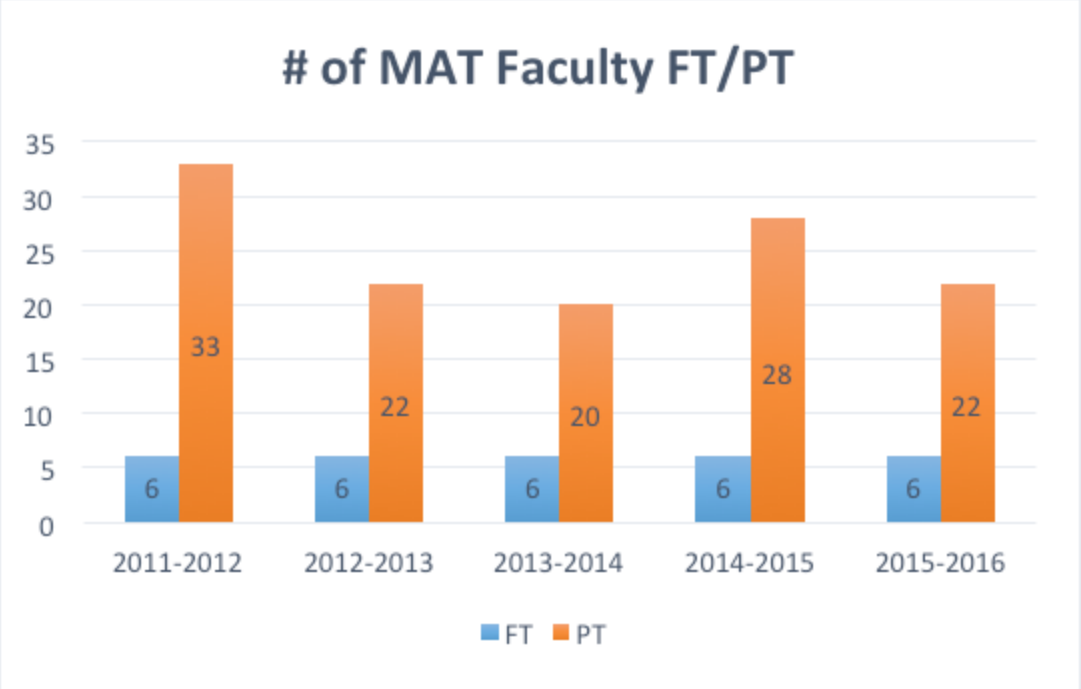
Not applicable

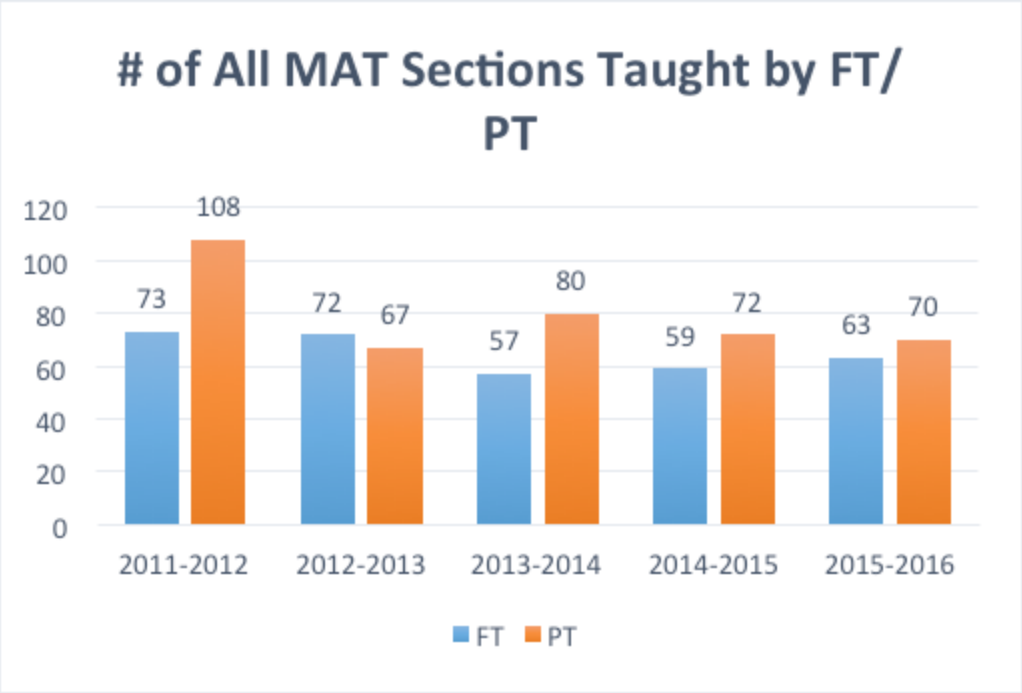
g. Teaching loads

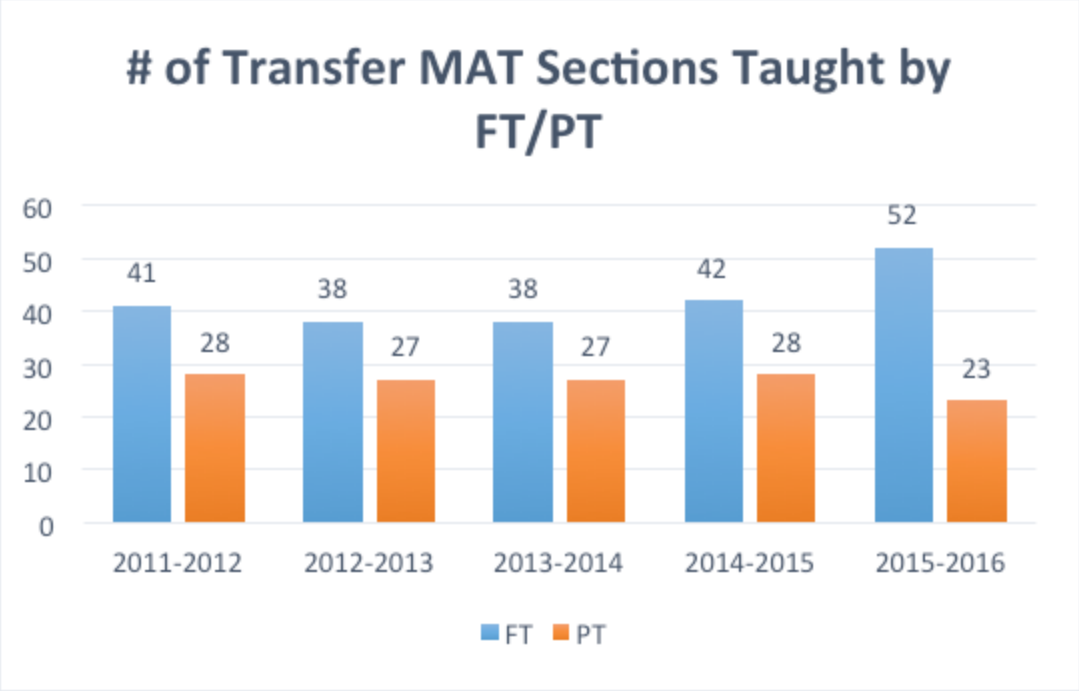
The Math department had five full-time faculty in 2011-2012. A sixth full-time faculty was added in the fall of 2012. In fall 2017, a seventh full-time faculty position was added. The seven full-time faculty members are responsible for teaching the majority of college level courses, developing curricula, and assessing learning outcomes. They hold office hours for at least five hours per week and participate in at least two college-wide committees. (See the full-time faculty job description for more details.) All full-time faculty are required to attend a department meeting twice a month. Teaching assignments may include alternative delivery methods including online, day and evening classes, and may be at multiple sites. This is a full-time, benefits eligible position. Full-time faculty teach a minimum of 30 load

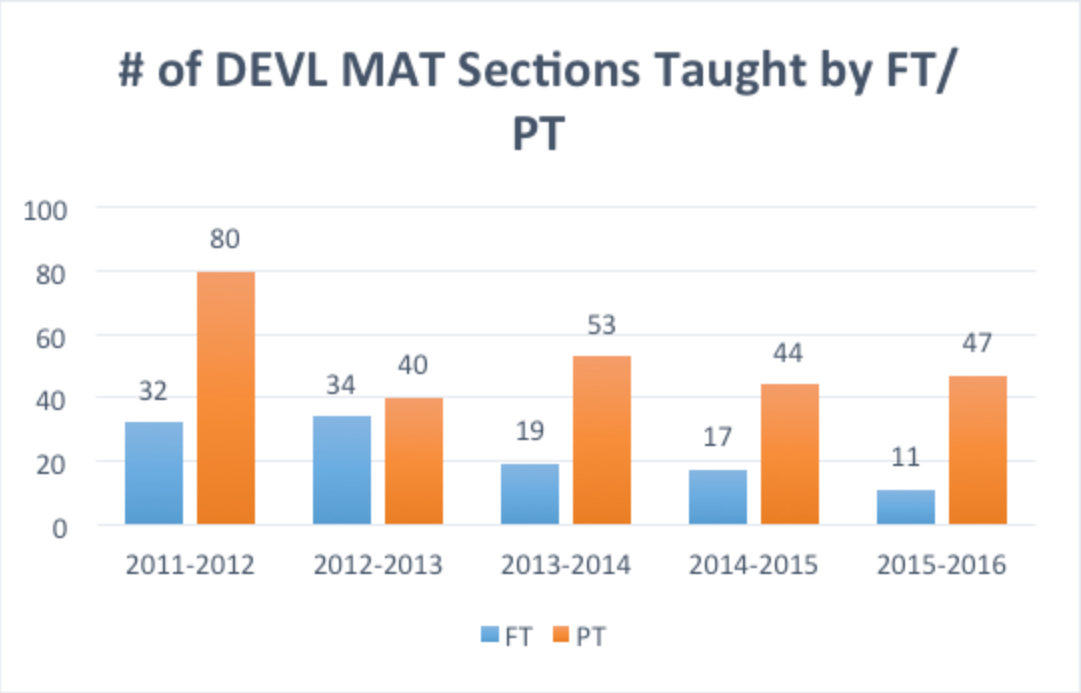
hours per year. In fiscal years 2011-2014 the department chair had nine hours a release time per semester. Since 2014, no full-time faculty member in the department has had any release time. As the department has added more sections of college-level courses the full-time faculty have needed to teach more college-level classes and less developmental-level classes due to a shortage of qualified part-time faculty. With the new HLC credentialing rules this shortage will only get worse. In order to cover instructor shortages in math, full-time faculty in the department have taught an average of 57.2 hours of overload per year for these five years. That averages to nearly 5 credits hours of overload per faculty member per semester. Combined with committee work the full-time math faculty load is excessive.

The part-time faculty members are responsible for teaching classes and assessing learning outcomes. Together, they teach the majority of the developmental courses offered each semester. They are not required to hold office hours or participate in committees. Part-time faculty are invited to participate in department meetings and to be involved in decisions affecting the whole department. Part-time faculty teach between three and 19 load hours per year. Teaching assignments may include alternative delivery methods including online, day and evening classes, and may be at multiple sites. This is not a benefits eligible position. The number of part-time faculty varies each year.




# of All MAT Sections Taught by FT/ PT
120
100
80
60
40
20
0
73
108
72
67
57
80
59
72
63
70
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
FT
PT


# of Transfer MAT Sections Taught by FT/PT
60
50
40
30
20
10
0
41
28
38
27
38
27
42
28
52
23
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
FT
PT



The math department needs to evaluate the ratio of full-time to part-time faculty. This information along with difficulty in finding credentialed math instructors may mean that we should look for another full-time faculty member. Include the comparison of the goal of 50% ratio of full-time to part-time faculty that the college has overall.

h. Faculty credentials

The seven full-time faculty members all have an MS in mathematics. Two members have an emphasis on statistics, four have an emphasis on pure math and one have an emphasis in mathematics education. For their undergraduate degrees, two are BS in Mathematics, two are in Education/Mathematics, and one each from Physics/Engineering, Physics/Mathematics, and Mathematics/Computer Science.

The part-time instructors during this time period had a variety of degrees as shown in the following table. Many of these instructors will not meet the new minimum requirements imposed by the HLC. Another concern is that 75 people applied for part-time faculty jobs during the 2016-2017 academic year, but none of those applicants were qualified for teaching math. These are weaknesses we will need to address.

Degree	Percentage
MS Math Education	30%
MS Mathematics	5%
MS Education	20%

PhD Astronomy	5%
MS Engineering	5%
MS Science	15%
BS Education	10%
BS Mathematics	10%

III. STAFF, RESOURCES, FACILITIES, and FUNDS

a. Internal strengths of the program

Dedicated faculty who are willing to propose new structures in the mathematics sequence and courses and willing to improve teaching strategies. Faculty are willing to adopt different pedagogies and delivery methods to provide for different student learning styles and needs. The faculty are also dedicated to teach overload so that courses are not cancelled and students are served. Mathematics faculty are involved in many aspects of governance of the college, and are involved with local, state, and national mathematical organizations. The math faculty are a very cohesive department that works well together and cooperates to improve the department and the college for the improvement of students learning.

b. Internal weaknesses of the program

There are not enough part-time faculty who are credentialed to teach mathematics courses, especially college level courses. There is not enough time to develop a plan for addressing the success rates in precalculus. The majority of full-time faculty are teaching overloads. The math faculty are involved in many aspects of the college, often in leadership roles, in addition to being dedicated faculty members. The full-time faculty have had to take on many of the duties of the department chair such as class schedules, textbooks, and assessment. The time required to complete these tasks has taken away time normally used for class preparation and professional development. Because of their involvement, they do not have the time to maintain balance in their lives.

There are not enough professional development funds for faculty training in new techniques in teaching. This means that faculty feel that they are lacking professional development opportunities. Changes made to mathematics requirements at universities is creating an articulation challenge to meet all of the different requirements at the three universities.

Classrooms were traditionally designated for a discipline and so mathematics faculty had the tools they needed to adequately teach their classes. However, due to new scheduling practices and other disciplines utilizing these classrooms, some math classes are not able to be in a mathematics designed classroom.

Loss of department chairs has been challenging. The faculty in the department have had to discover and distribute the workload to be sure that departmental duties were covered. Some duties still have not been taken over such as observation of part-time faculty, ensuring that curriculum is covered in all sections of the same class, part-time faculty attendance at Convocation and other

department events, ensuring that part-time faculty adhere to departmental guidelines such as grading requirements and chapter coverage lists. One recommendation to help with these issues is to create Canvas quizzes that all part-time faculty must take before they teach a class. These quizzes could be created and administered in the Math Department Canvas shell.

Issues with the tutoring area are an ongoing challenge. During the 2016-2017 academic year, a meeting took place between the tutoring staff and math faculty. This discussion was very beneficial to help the tutoring staff understand the expectations and requirements for tutors that the math faculty have. The SI program helps to alleviate tutoring challenges somewhat, but a more holistic and circumspect outlook on tutoring is necessary to improve student success. The math department will look into applying standards from AMATYC for best practices for math tutoring labs.

Challenges with the advising area include confusion with some of the math pathways and which courses students should take depending on their program of study. One recommendation to help with this problem is to have more regular ongoing communication between the math faculty and the advising staff.

c. List recommendations received since last program review or Program Advisory Committees

None

IV. ANALYSIS and RECOMMENDATIONS

a. Description of needs to conduct program, including space and equipment

- At least one additional full-time math instructor
- Continue and expand the Supplemental Instructor (SI) Program. In Fall 2017 the math department is expanding SI to MAT 097 and 211.
- Build platform in front of board in 107
- Purchase and install more up-to-date SmartBoard in 107
- Keep dedicated math classrooms with department technology, materials, and layout
- Build additional computer classroom with required software installed such as MATLAB and R
- Investigate mobile chair/desks for active classrooms
- Adequate tools such as tablet pens, dual monitors, etc. in full-time faculty offices
- A way to offer office hours to web students so that faculty can help multiple classes at the same time
- Revitalize the MAT 010 course. This course significantly helped students to have a higher success rate in their developmental course. It would be great to bring back the course and improve the advertising so that the course could have enough enrollment to run.

b. Assessment

i. History of assessment in the CCC mathematics department

CCC began a robust college-wide assessment program of academic programs in 2001. At that time, the mathematics department started the process of creating program outcomes, aligning course outcomes to the program outcomes, and creating tools to assess those outcomes. For many years, the math department annually conducted pre and post tests, final exam questions, and an attitudinal survey

in all mathematics courses at the college. In more recent years, program and general education outcomes were measured with projects in statistics classes. The results from this data were compiled each year and reports were created by the math and science department chair. It was typical to see from the results that students struggled in graphing and word problems in all levels of classes. Therefore, trainings and symposiums were conducted to train the faculty to focus more heavily on these topics. Improvements in these topics were shown in subsequent assessment activities.

In 2012, the leadership for continuing this assessment process was reduced due to several factors such as the removal of department chairs and changing staff in the Institutional Research and Academic Affairs areas. The math department did continue to assess some courses over the next four years, but overall reports were not required. Members of the math department have raw data from many courses, most of which has not been summarized or analyzed. The assessment activities during this time were not as comprehensive as in previous years, but some of these results are shown below.

The math program outcomes which were assessed using the above mentioned tools from 2001 on are as follows:

1. Apply mathematics in context using appropriate problem solving skills.
2. Solve equations.
3. Create and interpret graphical representation.
4. Perform operations on mathematical structures, which may include real, complex, matrix, or function space.
5. Work with geometric concepts.
6. Apply and interpret limits and limit definitions.
7. Gain appreciation of mathematics and its uses
8. Interpret and communicate mathematics.

ii. Math department assessment from 2012 through 2016

Summary of assessment in mathematics for the last five years.

Math Assessment usually consisted of five common final exam questions that measure program assessment outcomes aligned with General Education program outcomes. The grid below indicates when these courses were assessed using the common final questions, graded with the rubric, and raw data was collected. Raw data was compiled in FY 13 and FY 17. The years FY 14 raw data was collected but not compiled. FY 15 and 16, some raw data was collected. An X indicates data was collected for this course or group of courses in the given time frame.

Year	MAT 082	MAT 086	MAT 091	MAT 102x/122/121	MAT 140/142	MAT 160	MAT 172	Mat 187	Mat 220	Mat 230/241/262
FY 13 (F12-S13)	X	X	X	X	X	X	X			

FY 14 (F13-S14)	**X**	**X**	**X**	**X**	**Creation of MAT 140 X**	**X**	**X**			
FY 15 (F14-S15)				**Modification of number to MAT096/097**	**X**	**X**				
FY 16 (F15-S16)	**Creation of MAT 088**				**X**	**X**			**X**	
FY 17 (F16-S17)			**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

Definitions of proficiency levels for math program and Gen Ed outcomes

Definitions developed in Fall 2009 were used to create the grading rubrics for these courses.

Gen Ed Outcome 2a: Formulate vital questions and problems in a clear and precise manner.
Math Outcome 8: Communicate using the language of mathematics.
Mastery: The student can communicate in a clear and precise manner using the language of mathematics.
Proficient: The student's mathematical communication does not obscure meaning; however, there are some mathematical language errors.
Emerging: The student's mathematical language obscures meaning.

Gen Ed Outcome 2b: Gather, assess, and interpret information within a theoretical framework.
Math Outcome 3: Create and interpret graphical representation.
Mastery: The student can create and interpret graphical representation.
Proficient: The student can either create graphical representation or interpret it, but not both.
Emerging: The student has minimal understanding of creating and interpreting graphical representation.

Gen Ed Outcome 2c: Develop well-reasoned conclusions and solutions to problems.
Math Outcome 1: Apply mathematics in context using appropriate problem solving skills.
Mastery: The student can recognize a problem, develop a correct mathematical model to solve the problem, and find the correct solution to the problem.
Proficient: The student can recognize a problem, develop a reasonable mathematical model to solve the problem, but cannot find the correct solution to the problem.
Emerging: The student has minimal understanding of solving a problem.

Points from common final questions associated with proficiency levels:
Mastery: 4 or 5 points
Proficient: 2 or 3 points
Emerging: 0 or 1 points

Examples of assessment results from Spring 2012

MAT 010 Math Help

The following is a statistical analysis studying whether or not MAT 010, Math Help, was a beneficial class for developmental students at CCC. MAT 010 is a class that is designed as a co-enrolled class for students taking developmental math classes. The students sign up for the developmental class as well as the MAT 010. In MAT 010, students learn study skills and learning styles and they receive help with their developmental coursework.

Hypothesis: Students co-enrolled in MAT 010 while taking a developmental mathematics class at CCC have a higher success rate in their developmental course than students not co-enrolled in MAT 010.
p_1 = proportion of students who succeeded in developmental math class who were also co-enrolled in MAT 010
p_2 = proportion of students who succeeded in developmental math class who were not also co-enrolled in MAT 010
H_o: $p_1 = p_2$
H_1: $p_1 > p_2$
Alpha = 0.05
f_1 = frequency of students who succeeded (A, B, C) in a developmental math class who were also co-enrolled in MAT 010 = 101
f_2 = frequency of students who succeeded (A, B, C) in a developmental math class who were not also co-enrolled in MAT 010 = 1677
n_1 = number of students in developmental math class and co-enrolled in MAT 010 (W were excluded) = 131
n_2 = number of students in developmental math class and not co-enrolled in MAT 010 (W were excluded) = 2398
Z = 1.75
P-value = 0.040
p_1-hat = 0.771
p_2-hat = 0.699
There is enough evidence to show that students co-enrolled in MAT 010 have a higher success rate in their developmental class than students not co-enrolled in MAT 010.
90% confidence interval is 0.00934 to 0.13398. There is a 90% chance that the interval of 0.9934% to 13.298% contains the true success rate change for students co-enrolled in MAT 010 as compared with students not co-enrolled in MAT 010.

This analysis of data from MAT 010 shows that it was a beneficial course for most students who enrolled in it. The enrollment of the course has dwindled in recent years and the course is currently not being offered. Due to its statistical success, it would be beneficial to offer this course again. More advertising

would need to be done for this course and communication with advising and faculty about its benefits would be necessary to improve enrollment.

Survey Results

One of the assessment tools that the math department utilized for many years was an attitudinal survey. This survey was administered in all math classes to determine the level of students' attitudes towards mathematics. Below are the results in the developmental track through MAT 142 in Spring 2012.

		Appreciation of Math	Nature of Math
MAT 082	% Positive Attitude	61.59%	60.28%
	% Neutral	3.96%	12.06%
	% Negative Attitude	34.45%	27.66%
MAT 091	% Positive Attitude	65.93%	70.52%
	% Neutral	8.22%	14.89%
	% Negative Attitude	25.85%	14.59%
MAT 122	% Positive Attitude	63.53%	70.40%
	% Neutral	6.90%	12.62%
	% Negative Attitude	29.58%	16.98%
MAT 086	% Positive Attitude	61.62%	64.67%
	% Neutral	7.57%	13.25%
	% Negative Attitude	30.81%	22.08%
MAT 121	% Positive Attitude	65.85%	69.51%
	% Neutral	7.67%	11.79%
	% Negative Attitude	26.48%	18.70%
MAT 142	% Positive Attitude	66.06%	71.59%
	% Neutral	7.15%	14.06%
	% Negative Attitude	26.79%	14.36%

Examples of assessment results from Spring 2014

Comparison Between MAT 140 and MAT 142 Final Exam Questions Results

MAT 140-01

	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	47.1%	17.6%	0.0%	88.2%	35.3%
% Proficient	17.6%	35.3%	5.9%	11.8%	29.4%
% Mastery	35.3%	47.1%	94.1%	0.0%	35.3%

MAT 140-02

	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	60.0%	20.0%	6.7%	93.3%	46.7%
% Proficient	20.0%	26.7%	13.3%	6.7%	13.3%
% Mastery	20.0%	53.3%	80.0%	0.0%	40.0%

MAT 142-05

	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	25.0%	50.0%	8.3%	75.0%	8.3%
% Proficient	25.0%	25.0%	8.3%	16.7%	25.0%
% Mastery	50.0%	25.0%	83.3%	8.3%	66.7%

MAT 142-07

	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	63.6%	40.9%	0.0%	81.8%	45.5%
% Proficient	18.2%	27.3%	4.5%	9.1%	9.1%
% Mastery	18.2%	31.8%	95.5%	9.1%	45.5%

MAT 142-09

	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	88.9%	0.0%	11.1%	44.4%	100.0%
% Proficient	0.0%	44.4%	0.0%	55.6%	0.0%
% Mastery	11.1%	55.6%	88.9%	0.0%	0.0%

MAT 142-?

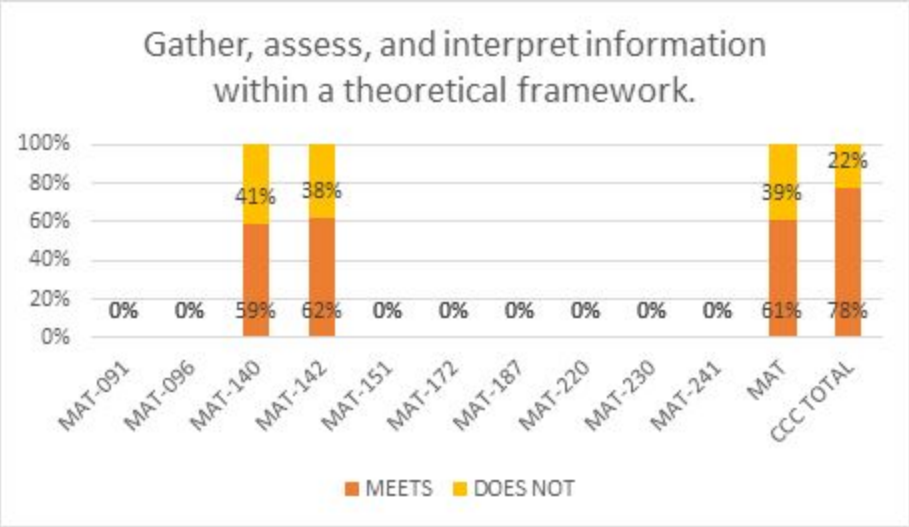
	Outcome 1	Outcome 2	Outcome 3	Outcome 7	Outcome 8
% Emerging	36.4%	18.2%	54.5%	18.2%	68.2%
% Proficient	31.8%	9.1%	0.0%	40.9%	0.0%
% Mastery	31.8%	72.7%	45.5%	40.9%	31.8%

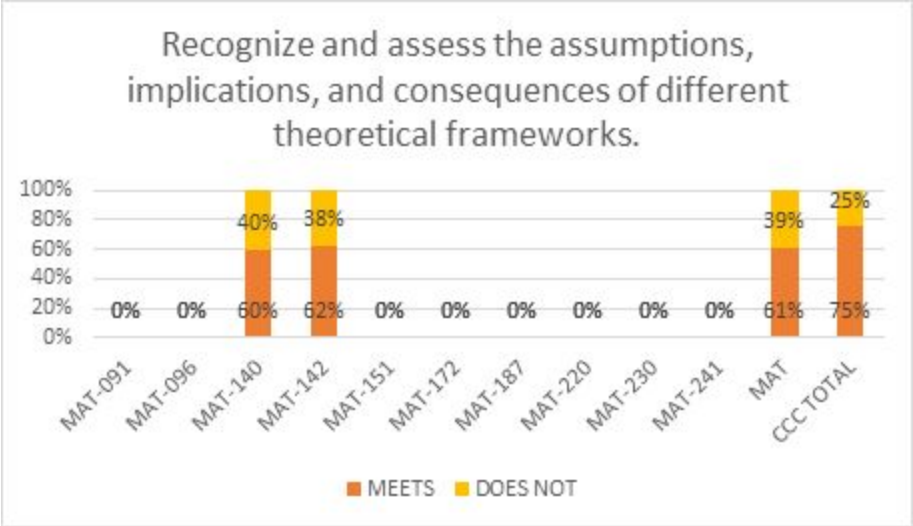
This data shows that the assessment results for the final exam questions given in MAT 140 and MAT 142 in order to assess program outcomes are comparable to one another or even better in MAT 140 which coincides with previous data regarding these two classes. This data also serves as an example of data that has been collected sporadically through the last five years. This data is available to do more analysis with but for the most part has not been compiled across sections nor analyzed previously.

iii. Math Department Assessment 2016-2017

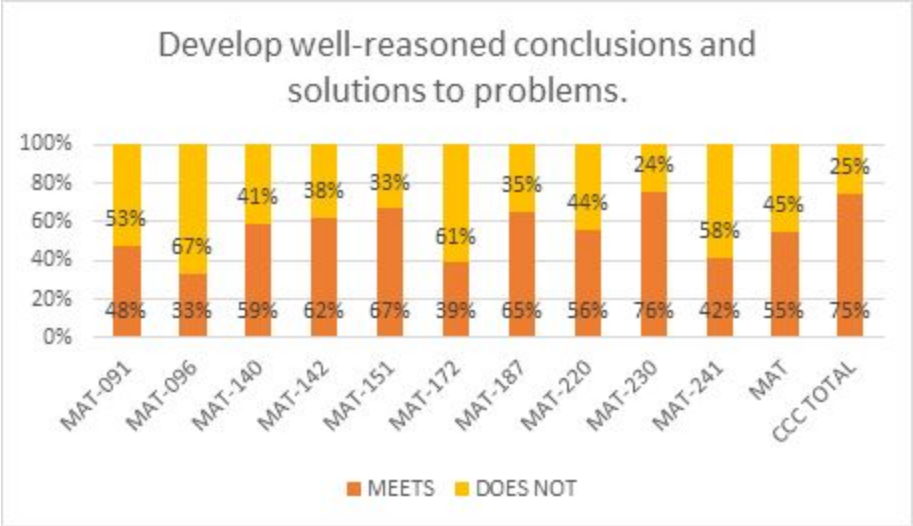
During FY 2017, the math department participated in general education assessment of critical thinking. During Fall, 2016, only full-time faculty were required to participate in this critical thinking assessment, but the math department asked part-time faculty to also participate. The courses in which critical thinking outcomes were assessed were MAT 091, MAT 096, MAT 140, MAT 142, MAT 151, MAT 172, MAT 187, MAT 220, MAT 230, and MAT 241. In all of these courses, five common final exam questions were modified and distributed to faculty to use on their final exams and faculty were asked to report back their assessment results. The overall results of these assessment activities for Fall 2016 are shown below.

The following graphs show the percentage of students in various classes who score at proficient or mastery level in the given critical thinking outcome stated in the heading of each graph. The graphs also show the overall assessment results of the entire college for that particular critical thinking outcome.





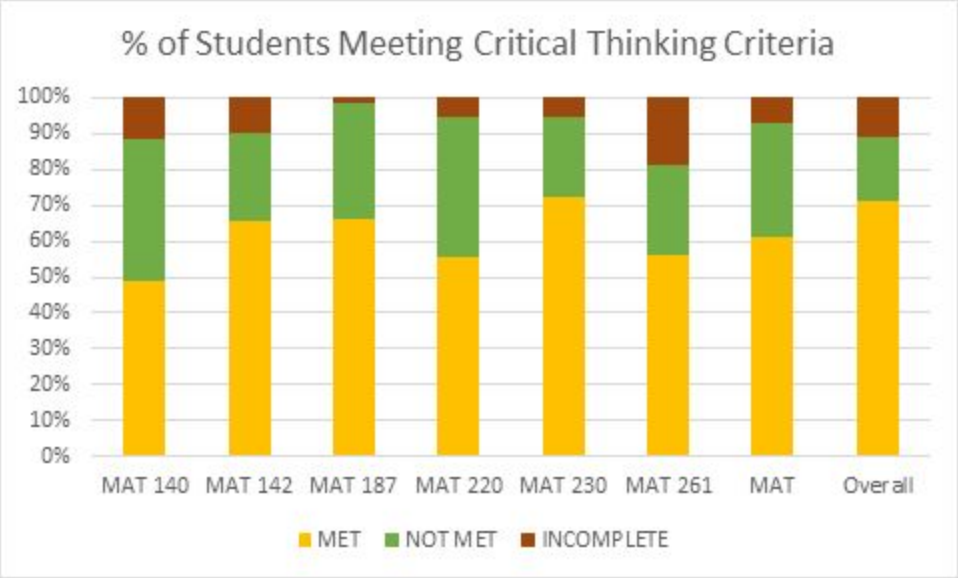
The two critical thinking outcomes shown above are only measured in the MAT 140/142 courses by the CCC math department. The overall percentage of students in these courses who were at proficient or mastery level for these outcomes is 61% and is relatively close in the two courses. The overall college assessments for these two outcomes have a success level of 78% and 75% respectively, which are somewhat higher than that for mathematics.



The only other critical thinking outcome that is measured in mathematics is shown above. The courses that show the lowest levels of proficiency or mastery on this critical thinking outcome are MAT 096, MAT 172, and MAT 241. Changes are being made to MAT 096, Intermediate Algebra, which was mentioned previously in this report. MAT 172, Finite Mathematics, and MAT 241, Differential Equations, are both more difficult courses with limited enrollment which are not taught in great abundance at CCC. Thus, the sample sizes for these results are quite a bit smaller than for many other courses. MyMathLab online homework is being used in MAT 172 to try to improve these outcomes. The courses that show the highest levels of proficiency and mastery on this outcome are MAT 230, MAT 187, and MAT 151.

These results for MAT 230 Calculus II and MAT 187 Precalculus are somewhat surprising in that the classes are quite challenging and traditionally have a high DFW rate. However, the data for this assessment is collected at the end of the semester in the final exam, therefore, it could be that the rather large number of students who dropped may have not participated in the assessment at all. Also, it is always good to recognize that the differences in course success rates could also be due to the final exam questions that were used and so the instruments should be analyzed for refinement.

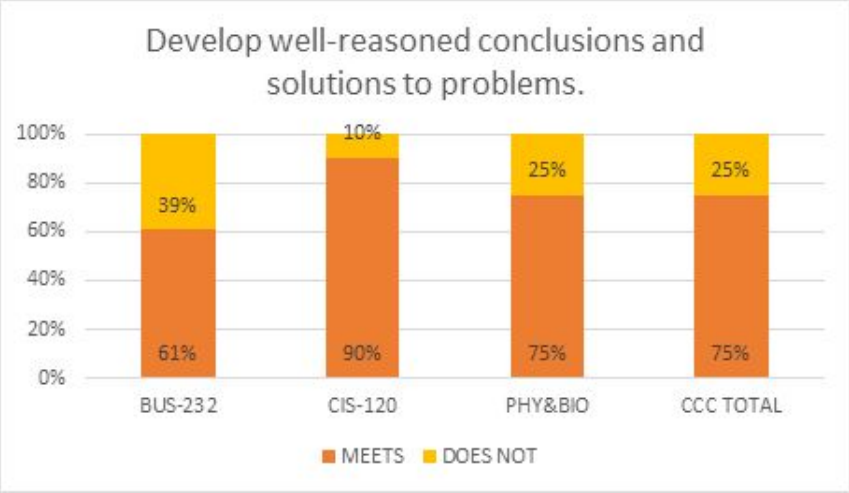
The same final exam questions were also used during Spring 2017 and the results of that assessment data is shown below. Unfortunately, this data was not reported per each critical thinking outcome, but just for the general education critical thinking criteria as a whole. Thus, the results of the assessment are presented in a different fashion. During Spring 2017, there were slightly better results overall and the courses that showed lower and higher percents of "met" were similar to Fall 2016.



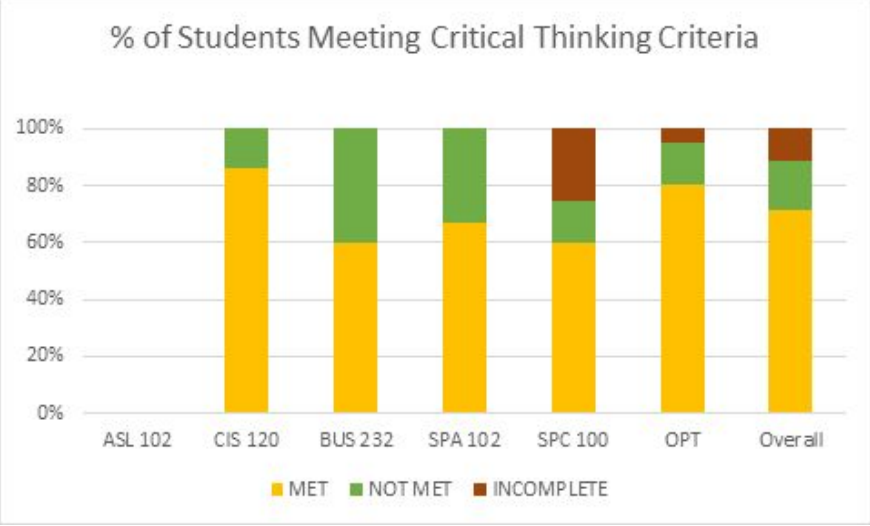
COURSE	MET	NOT MET	INCOMPLETE	N =
MAT 140	49%	40%	11%	4
MAT 142	66%	24%	10%	3
MAT 187	66%	33%	1%	2
MAT 220	56%	39%	6%	1
MAT 230	72%	22%	6%	1
MAT 261	56%	25%	19%	1
MAT	**61%**	**32%**	**7%**	**12**

Overall	**71%**	**18%**	**11%**	**115**

The graph shown below represents assessment data from the introductory statistics course taught at CCC during Fall 2016. This course is a cross-listed course which means that some students are enrolled in MAT 160 and other students are enrolled in BUS 232 but the course is taught as one. The assessment tool utilized in MAT 160/BUS 232 is a statistical project that is administered near the end of the semester. The students have to go through all steps of a statistical analysis from collecting their own data through analyzing the data. The project is graded using a rubric and the students "meet" the criteria for developing well-reasoned conclusions and solutions to problems by getting at least 60% of the project correct. The graph shows that 61% of students who took statistics met the requirements for this critical thinking outcome.



Similar data is shown below for the statistics course in Spring 2017. During this semester, 60% of students received a grade of "meets" on the statistical analysis project.



iv. Recommendations

See recommendations on page 31

c. Challenges

See internal weaknesses on page 30

d. Summary of Significant Developments

Detailed throughout program review document

V. Appendix documents

a. Course syllabi

COCONINO COMMUNITY COLLEGE
COURSE SYLLABUS
MAT 091 BEGINNING ALGEBRA
SECTION 6, 4 credit hours
Spring 2017
MTWR 9:00-10:50am, Rm. #518

Instructor: Maya Lanzetta
Office: Room 454
Phone: (928)226-4258
Email: maya.lanzetta@coconino.edu

Office Hours: Mon/Wed 12-1pm
Tue 11am-2pm
(You can also set up an appt with me)

COURSE REQUIREMENTS

- *MAT 091 Textbook through MyOpenMath.*
- Basic scientific calculator. No electronic devices can be used instead of a calculator.
- Access to CANVAS and ability to perform basic computer skills.

COURSE DESCRIPTION: Basic algebraic concepts including operations with signed numbers, exponents and radicals, linear equations and inequalities, polynomials, and graphing. 4 credit hours. **Prerequisite:** MAT 088 or placement.

COURSE CONTENT:

1. algebraic expressions: a. simplifying; b. evaluating;
2. solving linear equations;
3. solving and graphing linear inequalities on the number line;
4. solving compound inequalities;
5. solving absolute value equations;
6. the Cartesian coordinate system: a. graphing linear equations; b. slopes of lines; c. finding equations of lines;
7. solving systems of two linear equations;
8. addition, subtraction, multiplication, and division of polynomials;
9. factoring polynomials: a. greatest common factor; b. grouping; c. trinomials; d. special forms;
10. solving factorable quadratic equations with the Zero-Product Property;
11. and applications.

COURSE OUTCOMES: *The students will*

1. Perform the four basic operations, absolute values, & exponents on rational numbers.
2. Simplify algebraic expressions.
3. Solve linear equations.
4. Verify solutions of algebraic equations.
5. Use interval notation to describe solutions of inequalities.
6. Solve and graph linear inequalities.
7. Graph linear equations in two dimensions.
8. Solve systems of equations graphically and algebraically.
9. Simplify exponential expressions.
10. Perform basic operations on polynomial expressions.
11. Factor polynomials by removing the GCF.
12. Factor polynomials by grouping.
13. Factor trinomials using various methods including special forms.
14. Solve quadratic equations by factoring.
15. Solve application problems.

COURSE GOALS: To increase a students' mastery of introductory algebra skills including solving equations, inequalities and graphing in one and two dimensions. Students will develop a proficiency and understanding of algebraic expressions and equations, and inequalities to enable them to enter intermediate algebra.

COURSE POLICIES

Classroom Etiquette: Student participation and involvement in class is expected. **NO cell phone** or laptop use in class is allowed. Please make sure cell phones are put away and NOT on your desk. If you are texting or otherwise utilizing phones or computers in class you will be asked to leave.

Academic Dishonesty Procedure: Academic dishonesty is a violation of the Student Code of Conduct as defined in Procedure 503-01. When a student commits an act of academic dishonesty, the instructor is responsible for determining the grade for the course or assignments. Incidents of academic dishonesty are reported to the Dean of Student development and Community Engagement for adjudication and follow up. **Copying homework answers from the back of the book is an example of academic dishonesty.

Attendance: If you have six unexcused absences or miss an exam without contacting me you will be dropped from class.

College Policy: Attendance will be taken in this class. If you fail to attend the first week of class for in-person classes or fail to log-in and participate in an on-line class by the date identified on the schedule of courses or the class syllabus, you will be counted as a "no-show," and will be withdrawn from the class. Students who are withdrawn for non-attendance during the first week are also assessed a fee of $40 per credit hour. Financial Aid students who exceed the number of absences for a class may have their financial aid reduced or revoked causing a debt to be owed to CCC. Students may be suspended from receiving Financial Aid in future semesters for failure to attend classes at any point during the current semester. It is especially important that Financial Aid students attend all classes so that this does not happen. Regardless of whether or not you are a Financial Aid student, if you are going to be absent from a class, inform your instructor that you will be absent and follow the attendance requirements outlined in the syllabus in order to remain enrolled in the class.

Late Work Policy: NO late work is accepted

ASSESSMENT:

1) **Homework:** All homework is online through MyOpenMath linked directly to Canvas and due the next class period by midnight. No late work will be accepted. If you have questions about the homework please see me during my office hours. At the beginning of class you will take a short (10-15 minutes) group quiz over material similar to the homework.
   24-Hour Rule: If you do your homework within 24 hours of the lesson you will retain 80% of the knowledge (vs only 30%)!
   Resources Available:
   - Visit my office hours or email me through Canvas
   - See a tutor at the Student Center
   - If you quality, look into the TRIO Program.
   - Start a study group with classmates (extra credit)
2) **Daily Group Work:** Each class period you will complete a group work based on the lesson. There is NO make up of group work. I will drop the 3 lowest scores.
3) **Exams:** Four exams will be given. You are given the exam dates so plan on being in class for each exam. If you must miss an exam time (for example, very sick) make sure to contact your instructor BEFORE the test time and date to arrange a new test time. The exam will need to be made up before the next class if possible. Do NOT ask your instructor about a make up exam during class. Stop by my office before class or send me an email before class. You must show ALL appropriate work on exams in order to receive any credit.
4) **Final Exam:** A Comprehensive Final Exam will be given. There is NO make up of the final exam.

GOAL (COURSE OUTCOMES)	COURSE CONTENT	ASSESSMENT
Perform the four basic operations, absolute values, & exponents on rational numbers.	5. solving absolute value equations	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Simplify algebraic expressions.	1. algebraic expressions: a. simplifying; b. evaluating	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Solve linear equations.	2. solving linear equations	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Verify solutions of algebraic equations.	2. solving linear equations	Evaluation through homework, quizzes,

		group projects, individual projects and/or exams.
Use interval notation to describe solutions of inequalities.	3. solving and graphing linear inequalities on the number line 4. solving compound inequalities	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Solve and graph linear inequalities.	3. solving and graphing linear inequalities on the number line 4. solving compound inequalities	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Graph linear equations in two dimensions.	6. the Cartesian coordinate system: a. graphing linear equations; b. slopes of lines; c. finding equations of lines;	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Solve systems of equations graphically and algebraically.	7. solving systems of two linear equations	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Simplify exponential expressions.	1. algebraic expressions: a. simplifying; b. evaluating	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Perform basic operations on polynomial expressions.	8. addition, subtraction, multiplication, and division of polynomials	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Factor polynomials by removing the greatest common factor.	9. factoring polynomials: a. greatest common factor; c. trinomials;	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Factor polynomials by grouping.	9. factoring polynomials: b.grouping;	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Factor trinomials by using various methods including special forms.	9. factoring polynomials: c. trinomials; d. special forms	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Solve quadratic equations by factoring.	10. solving factorable quadratic equations with the Zero-Product Property	Evaluation through homework, quizzes, group projects, individual projects and/or exams.
Solve application problems.	11. and applications	Evaluation through homework, quizzes, group projects, individual projects and/or exams.

COURSE EVALUATION

Exams:	50%
Homework:	20%
Group Work:	10%
Final Exam:	20%
Total	**100%**

GRADING SCALE

90% to 100%	A	Excellent
80% to 89%	B	Exceeds Standard
70% to 79%	C	Meets Standard
60% to 69%	D	Below Standard
below 60%	F	Failure

FINAL EXAM POLICY: See College Policy 303-04.

EXTRA CREDIT: There is only ONE type of extra credit available in this class: attendance at a study group. (Please do not ask me at the end of the semester is there is anything you can do to improve your grade. Complete all your homework, study for the tests, and complete this one type of extra credit. There is no other extra credit.) The guidelines are:

- You can earn 2 points each week (1 for each study session) for a total of 30 points (5% of your grade).
- There must be at least 2 students and you must meet for at least 30 minutes.
- You must meet at the Student Center and turn in a signed study sheet from them. (Tutoring does NOT count as extra credit.)

Spring 2017 Course Schedule: MTWR 9:00-10:50 Room 518

Homework is due the next class period at midnight. NO LATE WORK IS ACCEPTED.

Monday	Tuesday	Wednesday	Thursday
3/20 Introduction/MML/ Chapter 0 Worksheet **HW due 3/21:** Video Lesson None Practice: Chap 0 Review	3/21 1.1:One-Step Eqns & 1.2: Two-Step Eqns **HW due 3/22:** VL: 1.1 & 1.2 Practice: 1.1 & 1.2	3/22 1.3: General Linear Eqns & 1.4: Solving with Fractions **HW due 3/23:** VL: 1.3 & 1.4 Practice: 1.3 & 1.4	3/23 1.5: Formulas, 3.1: Solve Ineq & 3.2: Comp Ineq **HW due 3/27:** VL: 1.5, 3.1 & 3.2 Practice: 1.5, 3.1 & 3.2
3/27 1.6: Abs Value Eqns & 3.3: Abs Value Ineq **HW due 3/28:** VL: 1.6 & 3.3 Practice: 1.6 & 3.3	3/28 Review for Exam 1 **HW:** Chp 1 Review	3/29 **EXAM 1**	3/30 2.1: Points and Lines & 2.2: Slope **HW due 4/3:** VL: 2.1 & 2.2 Practice: 2.2
4/3 2.3: Slope-Intercept Form **HW due 4/4** VL: 2.3 Practice: 2.3	4/4 2.4: Point-Slope Form **HW due 4/5:** VL: 2.4 Practice: 2.4	4/5 2.5: Parallel/Perp Lines **HW due 4/6:** VL: 2.5 Practice: 2.5 & Chp 2 Wrap-up	4/6 Review for Exam 2 **HW:** Chp 2 Review
4/10 **EXAM 2**	4/11 5.1: Exponent Prop & 5.2: Negative Exponents **HW due 4/13:** VL: 5.1 & 5.2 Practice: 5.1 & 5.2	4/12 Chapter 5 Practice Assignment (due 4/13)	4/13 5.4: Intro to Polynomials **HW due 4/17:** VL: 5.4 Practice: 5.4-5.7 (due 4/19)
4/17 5.5: Multiply Polynomials & 5.6: Special Products **HW due 4/18:** VL: 5.5 Practice: 5.4-5.7 (due 4/19)	4/18 5.7: Divide **HW due 4/19:** VL: 5.7 & 5.7 Extended Practice: 5.4-5.7 & 5.7 Extended	4/19 Review for Exam 3 **HW:** Chp 5 Review	4/20 **EXAM 3**
4/24 6.1: GCF & 6.2: Factor by Grouping **HW due 4/25:** VL: 6.1 & 6.2 Practice: 61 & 6.2	4/25 6.3: Factoring (Coef of 1) & 6.4: Factoring (Co. Not 1) **HW due 4/26:** VL: 6.3 & 6.4 Practice 6.3-6.4	4/26 6.5: Factoring Special Products **HW due 4/27:** VL: 6.5 Practice 6.5	4/27 6.7: Solving Quadratic Eqns by Factoring **HW due 5/1:** VL: 6.7 Practice 6.7
5/1 Review for Exam 4 **HW:** Chp 6 review	5/2 **EXAM 4**	5/3 4.1: Graphing & 4.2-4.3: Solving Algebraically **HW due 5/4:** VL: 4.1,4.2, 4.3 Practice 4.2-4.3	5/4 4.6: Mixture problems **HW due 5/8:** VL: 4.6 Practice: 4.6
5/8 Review for Final Exam	5/9 **COMPREHENSIVE FINAL EXAM**		

The Instructor reserves the right to add, delete, or modify the syllabus with reasonable notification

b. A job description of FT faculty

Job Title: Full-Time Faculty	Pay Grade: Salary placement on the Faculty Salary Schedule is based on education and experience. See the Faculty Salary Schedule for more information.
Department: Math Instructor	FLSA: Exempt
Reports To: Dean of Math and Science	Revision Date: 01/19/17

Summary

This position is responsible for teaching courses and assessing learning outcomes within the assigned discipline using effective pedagogy. This position is also responsible for assessment, curriculum development, and providing assistance and academic advising to students outside of regularly scheduled class time. Incumbent must be able to work collegially in a team environment. This is a full-time, benefit eligible position.

Essential Duties and Responsibilities

1. With Students:

· Teaches 30 load hours per year in a professional manner

· Provides advising outside of class time

· Maintains a minimum of five posted office hours per week

· Utilizes and assists and develops

2. With Colleagues:

· Adhere to a professional code of conduct and ethics

· Collaborate with other college employees as necessary and appropriate

3. Scheduling:

· Provides schedule building input and review as requested

4. Budget:

· Cooperates with supervisor on the department budget

5. Assessment and Strategic planning:

· Promotes the mission, values, purposes and the Strategic Plan of the College and learning college philosophy

· Participates in the development, implementation and assessment of programs, including the assessment of student learning outcomes as prescribed by department

6. Curriculum:

· Develops new or revises existing curricula as needed which may include College supported Articulation Task Force (ATF) participation

· Remain current in the assigned discipline(s)

· Maintain discipline/course specific certifications and licensure where appropriate

7. Institutional Leadership:

· Assists supervisor in the evaluation or mentoring of part-time faculty as requested

· Participates in the operation and/or shared governance of the college through college committee assignments and faculty meetings

· Assists in the building of programs relevant to their discipline and recruiting and retaining students in that program

· Serves as a professional role model for students and other faculty

c. A job description of PT faculty

Knowledge, Skills, and Abilities

Knowledge of current and effective pedagogical techniques. Ability to teach effectively. Knowledge of the subject areas in math. Available to teach summer classes or workshops and work at alternate CCC sites. Adhere to professional ethics and maintain confidentiality with students and staff. Ability to support and promote the mission, values, purposes, and strategic plan of the College. Ability to work in a culturally diverse and team environment. Ability to integrate subject area with other related curricula. Capacity to be flexible. Ability to teach using online learning management systems. Knowledge of computer software, including Microsoft Office products such as Word and Excel. Knowledge of the applicable state and federal laws, such as FERPA. Demonstrate fluency in written and oral communications.

Minimum Qualifications

· Master's Degree in Mathematics, Statistics or related field with 18 graduate level credit hours in Math

· Two years of college level teaching experience in mathematics

Preferred
PhD in Mathematics with experience teaching math at the community college level. Experience teaching online. Experience working with a diverse student population. Experience assuming leadership roles.

Physical Demands
The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. While performing the duties of this Job, the employee is regularly required to stand; walk; sit; use hands to finger, handle, or feel and talk or hear. The employee must occasionally lift and/or move up to 25 pounds. Specific vision abilities required by this job include close vision and ability to adjust focus.

Work Environment
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. The noise level in the work environment is usually moderate.

NOTE: This job description is not intended to be all-inclusive. Employee may perform other related duties to meet the ongoing needs of the organization.

Coconino Community College is an equal opportunity employer.
Auxiliary aids and services are available upon request to individuals with disabilities.

Job Title: Part-Time Faculty	**Pay Grade: N/A**
Department: Academic Affairs	**FLSA: Exempt**
Reports To: Department Chair	**Revision Date:**

Position Summary

Responsible for teaching courses within the assigned discipline. Teaching assignments may include alternative delivery methods, day, evening, and weekend classes, and may be at multiple sites. Must be able to work collegially in a team environment. This is a temporary, non-benefits eligible position. Employment is determined on a course to course basis.

Essential Duties and Responsibilities:

- Teaches courses as contracted. Maintains scheduled classes.
- Prepares and implements syllabi in accordance with course outcomes and competencies.
- Keeps and submits all essential instructional records according to the College calendar.
- Notifies department chairs in case of absence. Assists department chair in making arrangements for qualified substitute teachers.
- Follows all college policies and procedures as stated in the college procedures manuals and the faculty handbooks.
- Fosters community relationships.
- Attends college meetings as required.
- Participates in student assessment and relevant program assessment as directed by the department chair.
- Remains current in practices, trends and research related to areas of assignment.
- Performs other duties of a similar nature or level.

Knowledge, Skills and Abilities:

Ability to teach effectively. Knowledge of the subject area, computer and related technology. Ability to maintain professional ethics and confidentiality of students and staff. Ability to support and promote the mission, values, purposes, and strategic plan of the College. Ability to work in a culturally diverse and team environment. Ability to integrate subject area with other related curricula. Knowledge of the applicable state and federal laws, such as FERPA.

Minimum Qualifications:

Bachelor's degree and/or occupational experience. Certain disciplines require specific certifications, licenses, or Master's degree. All disciplines require an ability to meet all Coconino Community College credentials requirements.

Application Procedure:

All Faculty applicants must complete a Supplemental Credentials Application in addition to the online application. Please click here and add as an attachment to your application. Note, this attachment is a PDF document.