

# Mathematics Department

## AUP for Academic Year 2020-2021

October 2019

---

### Describe Department/Unit

#### Connection to College Mission

The Mathematics Department at Cerro Coso Community College plays an important role in preparing students to achieve their educational goals. The department currently offers math courses from one level below transfer to transfer level as well as an online math degree. Beginning in the fall of 2019, the department implemented a plan to accelerate students through the math sequence by placing all entering math students into either a transfer-level College Algebra (with concurrent support) or for non-STEM majors, a Beginning Probability and Statistics course with a lab to provide Algebra remediation. The department's curriculum supports the mathematical needs of other disciplines and programs. The department's courses help students develop logical reasoning and problem solving skills which form a foundation for their careers and future study. The Mathematics Department at Cerro Coso Community College offers classes which support the requirement for the AA and AS degrees, vocational/technical programs, and transfer to the university. We have entered into agreements and developed equivalencies with the California State Universities (CSU) and University of California (UC) systems. When our students transfer to the CSU or UC system, credits they earn in the mathematics department are transferable. This is also an indication that these transfer students from Cerro Coso Community College will be successful in completing higher degrees. The Mathematics Department offers courses at the Indian Wells Valley (IWW), Kern River Valley (KRV), Eastern Sierra College Center (ESCC), South Kern (SK), the Cal City and Tehachapi Correctional facilities as well as online. Cerro Coso's math curriculum is also offered as dual enrollment courses at Tehachapi, Cal City and Boron High Schools. Currently, three full-time faculty serve the IWW campus. One full-time faculty serves the KRV campus, and two full-time faculty share teaching classes at the ESCC campuses.

---

### Report on Improvements Made and Gaps Identified in the Prior Year

#### Student Equity: Actions Taken

The department realizes that lower success rates for some gap populations may be associated with the financial needs of lower-income students. To provide equal access to all students, over the past year more math faculty have implemented using OER's (open-ended resources) to lower textbook costs for students. In the spring semester a team of full-time and adjunct math faculty attended a conference on implementing OERs in online classes and making online classes accessible. We now have four instructors routinely using OERs for their instructional materials and that number will likely grow as we move forward in the future.

To address enrollment gaps, the department continues to try and engage a more diverse base of students into its Math and Science programs through community outreach events. The Math Department continues to participate in community outreach events by having math faculty participate in events like the eighth grade day and the "I'm Going to College Day" for fifth graders. All of these actions are undertaken as a means to broaden the interest in our math program.

In order to provide academic support for all students, the department has continued to staff a math lab with math instructors who are available to tutor students on a drop-in basis. To accommodate students with full-time jobs and other obligations, the lab is staffed morning, afternoons and evenings 4 days a week to maximize student access.

The department continues to adopt a best practice of greater transparency as a means to close achievement gaps in math classes. Over the past year, math instructors continue to implement best practices in all sections as a means to provide direction for students. Some of the practices include maintaining a Canvas course shell for on ground classes, clearly stating classroom expectations of both the instructor and student throughout the semester, and keeping students updated with frequent feedback on

their grades and performance. Other instructors have made online classes more accessible to students by embedding Publisher's websites directly into the Canvas shell.

## **Student Equity: Gaps to be Addressed**

### **Age: 20 to 29 years**

#### **Gap Identified:**

The success rate for the 20 to 24 age bracket was 56.9% which is 33.6% lower than the college-wide success rate for this age group. The success rate for 25 to 29 year old students was 61.9% which was 27.1% lower than the rate college-wide for this same age bracket. When compared with the average math success rate for 20 to 29 year old students over the past 5 years, the 20 to 24 age group performed about 1% point lower and the 25 to 29 age group performed about 4% performed higher over the past year.

The department will revisit the placement of students into math courses that routinely have low success rates. The department will discuss strategies to ensure that students are better prepared for the course they are taking as well as methods to better support students that are under prepared.

### **Ethnicity: American Indian**

#### **Gap Identified:**

American Indian students had a success rate of 50% over the past year which is 1% point above the average for the past 5 years.

The department will revisit the placement of students into math courses that routinely have low success rates. The department will discuss strategies to ensure that students are better prepared for the course they are taking as well as methods to better support students that are under prepared.

### **Ethnicity: African American**

#### **Gap Identified:**

African American students had a success rate of 60.3% over the past year in math. Still this success rate is up 8.3% points over the average rate for the last 5 years. So the gap is being narrowed for this group of students.

The department will revisit the placement of students into math courses that routinely have low success rates. The department will discuss strategies to ensure that students are better prepared for the course they are taking as well as methods to better support students that are under prepared.

### **Ethnicity: Filipino, Asian, Pacific Islander**

#### **Gap Identified:**

Filipino and Pacific Islander students had a success rate of 50% over the last year. This rate could be misleading as there were only 8 students in this population college-wide.

The department will revisit the placement of students into math courses that routinely have low success rates. The department will discuss strategies to ensure that students are better prepared for the course they are taking as well as methods to better support students that are under prepared.

### **Socioeconomic Status: Economically Disadvantaged**

#### **Gap Identified:**

Economically disadvantaged students had a success rate of 53.8% in math over the past year. Although a gap in achievement was identified for this group college-wide as well, the math success rate was 14.4% points lower than the success rate college-wide.

The math department will continue to increase the sections of math courses using OERs instead of costly textbooks.

## Outcomes Assessment: Actions Taken

### Actions taken in the prior academic year

One of the improvements made by the department was to reduce the number of SLOs in MATH C121, Statistics from 16 down to 4. The 4 SLOs now being used are more broad in scope. As well, over the past year, the course outline of record for this course was revised to include a lab portion to the course which provides an additional two hours of student contact time with the instructor. The lab content consists of algebra skills which are frequently used in the study of Statistics.

Another change which affected SLO assessments was to the Calculus courses MATH C151, 152, and 251. In changing the units for these courses from 5 to 4 units, the number of SLOs were reduced which allows instructors to spend more time working towards mastery of each SLO.

### Assessments completed in the prior academic year

In fall of 2018 the following courses were assessed: C121, C130, C142, C151, C152 online, C255 online, C257 online.

In spring of 2019 the following courses were assessed: C131, C141 on ground, c251 online

## Outcomes Assessment: Gaps to be Addressed

### MATH C130

**Type:**

SLO

**Target Missed/Gap Detected:**

1. Perform matrix calculations and utilize matrices for applied problem solving.
2. Define probability terms and exhibit proficiency in solving a variety of probability problems.
3. Analyze a financial problem and evaluate using formulas.

**Type of Gap:**

Student unpreparedness in reading, writing, or math. Student unpreparedness in soft skills (time mgmt, notetaking, etc.).

**Analysis and Plan for Improvement:**

Select different test problems.

**Anticipated Semester for Implementing Planned Improvements:**

fall 2019

**Anticipated Semester of Next Assessment:**

fall 2019 or 2020

**MATH C131**

**Type:**

SLO

**Target Missed/Gap Detected:**

3. Sketch the graph of functions using horizontal and vertical asymptotes, intercepts, and first and second derivatives to determine intervals where the function is increasing and decreasing, maximum and minimum values, intervals of concavity and points of inflection. 70/15.4%

11. Use calculus to analyze revenue, cost, and profit. 70/15.4%

**Type of Gap:**

Need for revision to outcomes.

**Analysis and Plan for Improvement:**

This course currently has eleven SLOs. The department will look to revising the COR to include fewer SLOs that are more broad in scope.

**Anticipated Semester for Implementing Planned Improvements:**

Spring 2021

**Anticipated Semester of Next Assessment:**

Spring 2021

**MATH C141**

**Type:**

SLO

**Target Missed/Gap Detected:**

2. Demonstrate how to find the domain of a function and the inverse of a one-to-one function. 70.0/ 28.3

3. Recognize the equations of lines, conics, and rational functions; describe their graphs and use their properties. 70.0/ 28.3

4. Recognize and demonstrate the interrelationships of transformations, symmetry, odd/even, maximum/minimum, asymptotes, and finding roots of polynomial functions by algebraic and calculator methods. 70.0/ 22.7

5. Recognize the equations of exponential functions and logarithmic functions, describe their graphs and use their properties algebraically and via calculator methods. 70.0/ 14.4

6. Use arithmetic and geometric sequences in applications. 70.0 / 36.6

7. Perform basic operations with matrices and determinants; solve systems of equations by multiple methods. 70.0/ 33.8

8. Find limit values through exploratory numerical methods and through application of basic algebraic principles. 70.0 / 8.8

9. Apply multiple approaches to problem solving, using algebraic, graphical, and numerical methods to solve applied problems in other areas of mathematics, natural sciences, computer graphics, and computer animation. 70/ 14.4

**Type of Gap:**

Need for better norming among subjective evaluators. Need for revision to assessment method.

**Analysis and Plan for Improvement:**

Only one section was assessed and it was a small class. If all sections including online sections were assessed, the overall percentages may improve.

Department will also look into another strategy for providing concurrent support for under prepared students.

**Anticipated Semester for Implementing Planned Improvements:**

Spring 2020

**Anticipated Semester of Next Assessment:**

Spring 2020

**MATH C251**

**Type:**

SLO

**Target Missed/Gap Detected:**

2. Use vectors and vector functions to model and solve problems by applying vector addition, scalar multiplication, the dot product, the cross product and the calculus of vector functions. 70/ 24.5

5. Use differentiation for vector-valued functions to compute tangent lines. 70/ 6.3

**Type of Gap:****Analysis and Plan for Improvement:**

Instructor can spend more time with the topic students find difficult.

**Anticipated Semester for Implementing Planned Improvements:**

Spring 2021

**Anticipated Semester of Next Assessment:**

Spring 2021

## Program Review: Actions Taken

### AS- T In Mathematics

**Year of Last Program Review:**

2016

**Actions Taken in the Prior Year to Address Strategies:**3 Year Strategies

One of the three year goals stated in the last Math Program Review was to investigate OER materials for math classes to reduce textbook costs to students. Currently four faculty are using OER materials such as Open Stax textbooks and the MyOpenMath site which are free to students. In spring of 2019 four math faculty attended a conference to learn more about using OERs for online Statistics and making all materials accessible. Thus progress towards this goal continues to be made and it appears that the use of OERs will increase as we move ahead into the future..

Another three-year goal was to define an improved SLO assessment process and then communicate the expectations and procedures to all department members. The first part of this goal was accomplished through the hard work of the SLO committee. Individual instructors entered SLO assessment data directly into eLumen in both fall 2018 and spring 2019 semesters. What remains to be accomplished is the dissemination of the procedure to check if a formal assessment needs to be done, agreement on strategies to put in place for meeting targets as well as what SLOs need to be reassessed. The department chair will work on a better system to communicate this information out to all instructors.

6 Year Strategies

A six year goal was to increase the number of math degrees awarded. There has been a steady increase in math degrees awarded over the past 5 years. Last year there were 11 math degrees awarded which is the highest number of math degrees awarded for an academic year over the last 5 years.

Another goal was to offer Differential Equations, MATH C255 online. This was accomplished in fall 2018. The department plans to move this class permanently in the long term schedule to an online format starting in fall of 2020.

Another goal was to have a majority of the Calculus courses taught by a full-time instructor. The department has addressed this as a full-time instructor currently teaches MATH C151 and MATH C152. This instructor most likely will be teaching MATH C251 within one or two years and this goal will be accomplished.

### **Strategies Still to be Addressed:**

Collect course progress data specific to students in the Math program.

Improve PLO Assessment Data Specific to Math Majors.

## **Annual Planning: Actions Taken**

### **Offer Corequisite Support Course for Math C055**

Between the time this initiative was proposed and now, the department has proceeded in a different direction. Due to AB 705 legislation, the 2 unit support classes were never developed. The department has eliminated offering MATH C040 and MATH C050 which in the past adequately prepared students for MATH C055. Currently in the fall 2019 semester, students in both on-ground and online MATH C055 are struggling. The department will continue to monitor success rates for both MATH C053 and MATH C055

---

## **Review of Current Year Initiatives**

### **Reminder of Initiatives for the Current Year**

#### **Increase the number of students completing transfer-level math in one year.**

Release time for math faculty to develop lab activities for MATH C121. Currently each instructor is doing their own thing with little collaboration.

#### **Sustain and increase the number of math courses offered in the Tehachapi area.**

There is a tremendous need for a class set of graphing calculators for the Tehachapi Prison Statistics classes. This is an equity issue. All other students taking statistics at the college are allowed online computational technology. The students at the Tehachapi prison are expected to do the same types of statistical tests doing the calculations by hand or using scientific calculators which are quite limited in their statistics capability.

#### **Offer College Algebra and Trigonometry at sites.**

---

## **Plan Initiatives for Next Year**

### **Initiatives for Next Academic Year**

#### **Increase the number of students completing transfer-level math in one year.**

Is this part of a multiyear initiative?

Yes

#### **Specific Action Steps to be Taken:**

Instructors discuss successes and issues with the MATH C121 lab.

Instructors revisit and evaluate the method of concurrent support for MATH C141.

Instructors discuss how to resolve the issue of under-prepared students in MATH C055.

#### **Lead Measure of Success:**

A list of math and algebra skills that students should be practicing in the MATH C121 lab will be included in the COR or posted on the department Canvas shell.

A COR for a 1 or 2 unit co-requisite course is written for MATH C141 or a lab concurrent support similar to MATH C121 is proposed for MATH C141.

A strategy to help under prepared MATH C055 students is agreed upon department-wide.

**Are any of the lead measures identified above lacking assessment instruments?**

No

**Does the department request help to develop these instruments?**

**Lag Measure of Success:**

All MATH C121 instructors will be choosing content for the lab portion of the class that is from a list of possible topics.

A new model/ method for providing concurrent support for MATH C141 is either implemented or in the CIC review process. The course name is changed from College Algebra to Pre-Calculus.

A strategy to help under prepared MATH C055 students is implemented.

**Person Responsible:**

Department Chair, Math Faculty

**It addresses a gap in outcomes assessment**

**Which strategic goal does this initiative address?**

Goal 1: Maximize Student Success, Goal 3: Ensure Student Access

**Offer College Algebra and Trigonometry at sites.**

**Is this part of a multiyear initiative?**

Yes

**Specific Action Steps to be Taken:**

MATH C141 is offered at the Tehachapi Center and Mammoth Campus sites

**Lead Measure of Success:**

Instructors teaching MATH C141 at the sites give early feedback on retention and success rates for spring 2020.

**Are any of the lead measures identified above lacking assessment instruments?**

Yes

**Does the department request help to develop these instruments?**

Yes

**Lag Measure of Success:**

Success and retention rates of MATH C141 inform the decision to offer MATH C142 at the sites.

**Person Responsible:**

Department Chair, Site Directors, Tehachapi Center and Mammoth Campus Faculty

**Other**

It addresses another unit initiative. Increase the number of students completing a transfer-level course in one year.

**Which strategic goal does this initiative address?**

Goal 1: Maximize Student Success, Goal 2: Advance Student Equity Measures, Goal 3: Ensure Student Access

**Receive approval of a transfer-level course in the OEI Exchange**

**Is this part of a multiyear initiative?**

Yes

**Specific Action Steps to be Taken:**

Implementation of OER (Open Ended Resource Materials) in a transfer-level course.

**Lead Measure of Success:**

A transfer-level course is submitted to the exchange.

**Are any of the lead measures identified above lacking assessment instruments?**

Yes

**Does the department request help to develop these instruments?**

Yes

**Lag Measure of Success:**

A transfer-level course is approved by the exchange.

**Person Responsible:**

Department Chair, Math Faculty

**It addresses a gap in student equity**

**Which strategic goal does this initiative address?**

Goal 1: Maximize Student Success, Goal 2: Advance Student Equity Measures, Goal 3: Ensure Student Access

---

## Evaluate Resource Needs

### Facilities

No needs at this time.

### Information Technology

No needs at this time.

### Marketing

The department does not foresee any current needs in marketing.

### Professional Development

Funding for release time for math faculty to collaborate and decide on the topics of the MATH C121 lab.

### Research and Data

Success and retention data are needed for MATH 141 at Tehachapi Center and at the Mammoth campus.

Success and retention data are also needed for all sections of MATH 121 through spring 2020.

---

## Staffing Requests

### 1000 Category - Certificated Positions

#### Mathematics

**Location:**

**Justification:**

No full-time faculty position is requested at this time.

### 2000 Category - Classified Staff

**None**

**Location:**

**Salary Grade:**

**Number of Months:**

**Number of Hours per Week:**

**Salary Amount:**

**Justification:**

No classified staff are requested at this time.