Mathematics PUR 2018-19 Latest Version

Mathematics PUR 2018-19 (Transfer Programs)

I. PROGRAM/UNIT OVERVIEW

Program or Unit Description : Version by **Winston, James** on **11/28/2018 14:41**

Describe the program/unit, including but not limited to the following: academic division that the program/unit belongs to, the academic areas and degrees/certificates offered, average student enrollment, number of full-time faculty, type of curriculum or pedagogical approaches, and any other pertinent aspect of the program/unit.

The mathematics department is a unit of TMCC's Sciences Division. The department currently has 22 full-time faculty. The department offers a 2-year transferable degree: Associate of Science, Mathematics. The curriculum offered emphasizes knowledge and practice through a variety of pedagogical approaches (lecture, lab, small group work, "flipped classroom," etc.).

Program or Unit Mission : Version by **Winston, James** on **11/27/2018 12:12**

State the department's or unit's mission, and describe how it aligns to the College's Mission and Core Themes (http://www.tmcc.edu/about/). If your department or unit does not currently have a mission statement, please discuss among your colleagues and develop one.

The mission of the TMCC Mathematics Department is to provide students with the mathematical skills and conceptual understanding needed for success in college-level courses, to help students succeed in their chosen fields of study, to give students life-long problem solving and analytical thinking skills, and to increase the math literacy of the student population. This mission reflects the College's mission to "promote student success, academic excellence and access to lifelong learning by supporting high-quality education and services within our diverse community" and mirrors the College's Core Themes of Student Success, Academic Excellence, and Access to Lifelong Learning.

Degrees and/or Certificates Offered : Version by **Deadmond, Melissa** on **09/05/2018 18:10**

Degree and/or Certificates Offered
Associate of Science, Mathematics

Program Learning Outcomes : Version by **Deadmond, Melissa** on **09/05/2018 18:11**

Program (Degree or Certificate Learning Outcomes)
Department of Mathematics
PSLO
Associate of Science, Mathematics
Communicate mathematical information formally through appropriate notation, terminology, and graphical representation as well as communicate mathematical ideas informally using everyday language.
Select and apply the appropriate algorithm or methodology to solve mathematical problems.
Use deductive reasoning to construct mathematical proofs.

General Education Learning Outcomes : Version by **Winston, James** on **11/27/2018 12:14**

General Education Learning Outcomes Assessed by the Department/Unit
Truckee Meadows
ISLO
Quantitative Reasoning
Students will construct a generalized model based on the specifics of a system being investigated.
Students will deduce the consequences of a particular model under different contexts, scenarios and/or constraints
Students will evaluate mathematical and/or logical results for issues of validity, accuracy and/or relevance to the real world
Students will make hypotheses and/or predictions
Students will modify models based on new information
Students will represent the relevant details of a system in terms of the appropriate scientific and/or mathematical model.
Students will translate the parameters of a scientific and/or mathematical model into the details of the system being modeled.
Students will use appropriate mathematics to solve application problems
Students will use the mathematics appropriate to a particular problem to obtain correct solutions.
Critical Thinking
Students will analyze and evaluate the context, assumptions, and/or bias regarding the main problem, issue, or arguments.

General Education Learning Outcomes Assessed by the Department/Unit
Students will discuss the implications and consequences of their own work, including conclusions, findings, projects, or products.
Students will draw valid conclusions
Students will evaluate the quality of supporting data or evidence.
Students will identify and evaluate relevant and valid points of view, including cultural values, conceptual models, theoretical frameworks, or different methodologies
Students will identify and summarize, or explain the main question(s), problem(s), issue(s), points and/or argument(s).
Students will state a position, perspective, thesis, hypothesis, argument, or findings, based on a line of reasoning and/or evidence.

Five-Year Plan Summary : Version by **Lambert, Theodore** on **12/07/2018 18:35**

What are the major objectives that the department/unit hopes to accomplish, including an estimated time to completion?

Offering two new classes, MATH 295 and Math 330, so that the TMCC AS in Mathematics will transfer seamlessly towards a mathematics bachelors degree at UNR (completion asap). Better aligning curriculum and standards throughout all courses so that all students will acquire the skills necessary to succeed in the course and subsequent courses (ongoing objective). Offering each semester a schedule that best allows students to comply with the NSHE Gateway policy that requires degree seekers to finish a college level course within two semesters after enrolling at TMCC (ongoing objective). Development of course guides for both math 95 and math 96. These will better enable us to standardize both curriculum and standards given the number of part-time faculty teaching these courses.\u200B\u200B\u200B\u200B\u200B\u200B\u200B\u200B

How does the department/unit plan to improve student learning?

The department works to properly place students so that they will have the prerequisite skills upon beginning a class. The department continues to offer a variety of class formats aimed at serving the variety of student needs. The department works with the Tutoring Center to ensure that students are properly helped during tutoring sessions. The department encourages in-house and external professional development for its faculty aimed at enhancing each faculty member's pedagogical approaches. The department is working to align its online classes with QM standards. The department encourages its faculty to work with the Disability Resource Center to ensure accessibily to its classes for students with disabilities. The department encourages the use of a variety of classroom technologies to enhance the teaching of math courses at all levels--technologies such as ActionPoint, Adobe Pro, ALEKS, graphing calculators, CamScanner, Camtasia, Desmos, GeoGebra, Graph.exe, Homework Assistant, IMPERIO software, Kaltura, Mathematica, and many more.

How does the department/unit plan to improve degree and/or certificate completions or course completions?

MATH 295 and Math 330 will allow TMCC AS in Mathematics students a seamless 2+2 transition into a mathematics bachelors degree at UNR. Timely degree/certificate completion rests upon timely course completion: a current major and ongoing focus of the department is to offer each semester a schedule that best allows students to comply with the NSHE Gateway policy that requires degree seekers to finish a college level course within two semesters after enrolling at TMCC.

How does this departmental/unit level plan align to the College's mission (http://www.tmcc.edu/about/) and Strategic Master Plan (http://www.tmcc.edu/media/tmcc/departments/accreditation/documents/reports/2014/ACCRStrategicPlan2014.pdf#search="strategic master plan")? Specifically, to which core theme(s), objective(s), and indicator(s) does (do) the departmental/unit level plan align?

The mission of the TMCC Mathematics Department--to provide students with the mathematical skills and conceptual understanding needed for success in college-level courses, to help students succeed in their chosen fields of study, to give students life-long problem solving and analytical thinking skills, and to increase the math literacy of the student population--closely reflects the College's mission to promote student success, academic excellence and access to lifelong learning.

What resources does the department/unit anticipate needing in order to complete the 5-year plan?

Finding degree-qualified part time instructors remains a major obstacle: qualified part time math instructors will choose to teach at UNR rather than at TMCC because they are paid more at UNR than at TMCC. Paying degree-qualified TMCC math instructors at the same rate as UNR part-time instructors would help alleviate this problem. More high tech, TIER 2 classrooms are needed during high demand times.

II. CURRENT STATUS OF THE PROGRAM/UNIT

Summary of Previous PUR Findings and Annual Progress Reports (APRs) : Version by **Lambert, Theodore** on **12/07/2018 18:40**

Program/Unit	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Mathematics	PUR		APR	APR		

Describe the major findings and recommendations for the program/unit from the last PUR and any APRs.

1. The budget situation at TMCC is a significant factor affecting curriculum. Performance-based funding concepts will likely put tremendous pressure on the Department to increase student pass rates, potentially at the expense of student success as it relates to outcomes and standards.

2. The Department is committed to encouraging student use of available academic support services such as tutoring and supplemental instruction, but larger institutional investment will need to be made in these services for increased student success and accessibility.

3. Another significant factor affecting curriculum is the proliferation of Massive Open Online Classes, (MOOCs), which could allow under-prepared students to gain access to TMCC Mathematics courses if MOOCs are accepted as equivalent to TMCC prerequisites. It is imperative that institutional and departmental policies be established which require students to show prerequisite skills in the absence of institutionally recognized articulation agreements.

4. The general acceptance of the Complete College America recommendations will decrease the relevancy of the current set of course outcomes relative to the aims of the recommendations. What will likely result is a need to re-design course outcomes so foundational skills, (Developmental skills), can be woven into the college level outcomes while maintaining acceptable college-level Standards for Intellectual Development. A process for re-designing the course outcomes will need to be implemented to address the lack of prerequisite skills. In order for this process to be completed successfully, additional Professional Development opportunities for Faculty will need to be made available

5. There is a clear break in the data beginning in the fall 2009 semester. The percentage of students taking a developmental math class prior to completing 12 credits fell from 86% to 76%. This is due to TMCC restructuring its developmental offerings. Many fewer sections of math 095 and 096 were offered, and math 093 is no longer offered at TMCC. One effect of this is to delay enrollment in a developmental math class at TMCC. This is not necessarily negative, since it includes students taking classes who are in the Skills Center and who thus delay enrolling in a developmental class.

6. Over the past 5 years, the Math Department has seen an increase in retention rates for developmental classes (41% Fall 07 to 64% Spring 12) as well as for college classes (58% Fall 07 to 68% Spring 12). The department continually reviews the data and assesses each course on a continual basis in order to make adjustments to the curriculum, course requirements, Accuplacer cut scores and teaching methods that will help improve retention and student success. As we look towards the future, this assessment of the data must continue and is imperative to meeting the demands of the students while maintaining a high level of rigor in the courses offered in the department.

7. The department will also look to increase the enrollment of female and Hispanic students in the STEM focused university parallel courses as these groups tend to be underrepresented across the nation. As mentioned in the demographic findings, we already see a higher percentage of these groups in developmental courses, but our target would be to increase the percent of these groups in STEM math courses with completion of the math emphasis.

8. Cooperation and communication with local high school students is an important task of the college and the math department. As such, it is suggested that this work continues.

9. In the coming years, the department plans on offering more mini sessions available for a greater variety of courses. Currently, we offer mini sessions for Math 95 and Math 96, but are in the planning process to offer it for Math 120, Math 126, and Math 127. Additionally, this will help meet the needs of the students since they will potentially be able to complete the required math classes in one semester. The department is also currently looking into offering stretch courses as well to help shorten the time it takes students to complete the math requirements. These stretch classes will incorporate developmental and college level math class material in within one semester. All of these new course offerings will need to be assessed in the coming years to determine their effectiveness. Self-Study Summary

10. As a large department, it is necessary to maintain communication with part-time faculty. Current work by math faculty is being done in conjunction with the college to create a best practices document for working with part-time faculty to improve communication with students and to ensure the curriculum is being covered and assessed. It is suggested that work continues on this document and is made available for all faculty to review and implement in the coming years.

11. With a full-time/part-time ratio of roughly 60/40 we are doing well compared to the college average which is 53/47. With the difficulties associated with finding qualified part-time faculty in mathematics, we hope to keep the ratio at its present level or improve it further.

Which findings and recommendations has the program/unit addressed?

The math department is now offering a wide range of class options for students. These include mini-session, hybrid, online, lecture, jumpstart, summer bridge, large lecture, and stretch. We now allow students to enter math 120 with a B or better in math 95, thus allowing students to bypass math 96.

In our previous PUR the dean recommended that we assess our courses less frequently to allow time to implement recommendations prior to the next assessment cycle. We have built a comprehensive and strategically designed assessment schedule through the year 2022.

We have been unable to find and/or retain part-time faculty qualified to teach UP math classes (classes at the 100+ level). UNR offers these same potential faculty more money for the same classes so without differential pay we have been unable to recruit them.

We are in the process of creating course guides for math 95 and math 96 to maintain consistent curriculum given the high percentage of part-time faculty teaching these courses.

Which have yet to be accomplished? Which are no longer relevant, and why?

Any of the previous recommendations which have not been accomplished will be ongoing for the math department for the foreseeable future.

Describe any major changes that the program/unit has undergone since the last PUR.

We are adding math 330 and math 295 to our course offerings.

A new placement test is being implemented starting in 2019. This test was not selected by the math department nor was it our preferred placement product. We were involved in the selection of scores to be used and will need to monitor how well it works.

External Review : Version by **Lambert, Theodore** on **12/03/2018 18:18**

If applicable, describe the major recommendations made by external reviewers, such as advisory boards, articulation committees, program accreditors, etc. What progress had the department/unit made towards those recommendations?

N/A

III. CURRICULUM

Transfer Programs (AA/AS Degrees) : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

Which Bachelor's degrees(s) does the program's AA or AS degree(s) align with, especially within the Nevada System of Higher Education (NSHE)?

The Associate of Science, Mathematics is a two-year transferable degree. This program will provide students with the necessary background in calculus and differential equations needed for a bachelor's degree in mathematics and will also provide the computer science needed for a bachelor of science degree at UNR. All courses recommended will partially satisfy the degree requirements for any of the bachelor's degree options offered by the mathematics department at the University of Nevada, Reno.

Does the program's suggested course sequence allow for efficient completion of the AA or AS? Explain.

As can be seen from the recommended course sequence in the catalog, it is very possible for a student to complete a mathematics emphasis at TMCC in four semesters. This includes all general education and other non-math courses required for the degree.

Recommended Course Sequence

1st semester		Units
CS 135 (http://catalog.tmcc.edu/search/?P=CS%20135)	Computer Science I	3
ENG 101 (http://catalog.tmcc.edu/search/?P=ENG%20101)	Composition I	3
or ENG 113 (http://catalog.tmcc.edu/search/?P=ENG%20113)	or Composition I for International Students	
Fine Arts [3]		3
Science [3]		3
MATH 181 (http://catalog.tmcc.edu/search/?P=MATH%20181)	Calculus I	4
	Semester Total	16
2nd semester		
CS 202 (http://catalog.tmcc.edu/search/?P=CS%20202)	Computer Science II	3
U.S. and Nevada Constitutions [3]		3
ENG 102 (http://catalog.tmcc.edu/search/?P=ENG%20102)	Composition II	3
or ENG 114 (http://catalog.tmcc.edu/search/?P=ENG%20114)	or Composition II For International Students	
Science [3]		3
MATH 182 (http://catalog.tmcc.edu/search/?P=MATH%20182)	Calculus II	4
	Semester Total	16
3rd semester		
Elective [4]		3
Humanities [3]		3
Science [3]		6
MATH 283 (http://catalog.tmcc.edu/search/?P=MATH%20283)	Calculus III	4
	Semester Total	16
4th semester		
Select 2 electives [4]		6
Social Science/Diversity [3]		3
MATH 285 (http://catalog.tmcc.edu/search/?P=MATH%20285)	Differential Equations	3
	Semester Total	12
	Total Units	60

Are there any hidden prerequisites (courses which have 1 or more pre-requisites that are not listed as part of the program)?

The two course listed as prerequisites for the AS degree in mathematics are math 126 and math 127. It is expected that the overwhelming majority of mathematics degree seeking students will have completed these prior to enrolling at TMCC. However, for those students who have not completed the precalculus courses (since they are college level classes), TMCC offers both classes in the mini-session format, which allows students to complete both math 126 and math 127 in one semester. In addition, students may take both math 126 and 127 during our two-session summer programs.

Since math 285 has math 182 as a prerequisite, it is possible for an under-prepared student still to complete the AS mathematics degree in four semesters. Math 126 and math 127 can both count toward the degree as electives so that the requirement of 60 credit hours is not surreptitiously raised.

Does the AA or AS transfer seamlessly in a 2+2 agreement without a loss of credits or a substantial amount of courses counting only as general electives? Explain.

Currently, though the AS degree in mathematics is close to transferring seamlessly to the Mathematics baccalaureate program at the University of Nevada, Reno, the university has a non-standard course, MATH 295 – Proof Writing for Math/Stat Major, in their B.A. and B.S degree requirements.

Faculty in the TMCC math department are presently in process of designing and preparing a course, MATH 295, equivalent to this required class as UNR. Upon approval of this class and publication in the TMCC catalog, and integration into the TMCC curriculum for the mathematics AS degree, the transfer to a mathematics bachelors degree at UNR will be a seamless 2 + 2 transfer.

Is program and course information up-to-date in the catalog? Explain.

The math department is constantly reviewing and updating all math course information for all of its classes, including prerequisites, formats, course assessment and general education assessment requirements in coordination with the Academic Standards and Assessment Committee.

As of this writing, all course information and program information is up to date in the published catalog.

Accessibility of Instructional Materials : Version by **Cotter, James** on **11/16/2018 23:22**

What is the department/unit currently doing or plan to do to help ensure that instructional materials are accessible to students with disabilities? For example, have you attended or participated in any accessibility training? Have you used the accessibility pre-purchase checker when purchasing new curricular materials?

Accessibility training is offered regularly at the beginning of each semester during our faculty professional development days. Additionally, the Disability Resource center on campus is ready and willing to help all faculty with any accessibility issues and provide resources and help for students with disabilities.

The Math Department was recently successful in putting an online course through the Quality Matters Certification process. Accessibility is a central question in QM, and a course must meet the QM Standard for accessibility in order to be certified. This shows the Department is moving forward with addressing accessibility issues and has established a blueprint for online and hybrid classes.

The math department faculty use a wide variety of online tools to aid instruction. The main ones are listed below with links to their accessibility information and policies. We strive to make all our materials accessible to students with various disabilities.

MyMathLab and Pearson products accessibility support and information can be found at this link. https://www.pearson.com/us/accessibility.html (https://www.pearson.com/us/accessibility.html)
WebWork accessibility documentation and support is found at this link. http://webwork.maa.org/wiki/Accessibility_Guide#.W-y4u-JRfcs (http://webwork.maa.org/wiki/Accessibility_Guide%23.W-y4u-JRfcs)
OpenStax accessibility statement can be found at this link. https://openstax.org/accessibility-statement (https://openstax.org/accessibility-statement)
WebAssign accessibility documentation is found here: https://www.webassign.com/instructors/features/accessibility/ (https://www.webassign.com/instructors/features/accessibility/).

IV. PROGRAM/UNIT ASSESSMENT

Evidence of Program Assessment : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

What is the evidence of student learning in the program as a result of course-level assessment? Please review past course assessment reports (CARs) and follow the outline below:

1. **Program Student Learning Outcome (PSLO)**
   1. **List a course and CSLO that aligns to this PSLO**
      1. **Summarize the most significant CSLO assessment results and subsequent plans that were implemented to try and improve teaching and learning.**
   2. **List a second course and CSLO that aligns to this PSLO**
      1. **Summarize the most significant CSLO assessment results and subsequent plans that were implemented to try and improve teaching and learning.**
   3. *Repeat until all courses and CSLOs that map to this PSLO are included . . .*
      1. *Repeat until all assessment result and improvement plan summaries are complete. . .*

1. Program Student Learning Outcome #1: Communicate mathematical information formally through appropriate notation, terminology, and graphical representation as well as communicate mathematical ideas informally using everyday language.

1. Course #1: MATH 181: The student will be able to interpret the derivative of a function graphically, numerically, and analytically.

1. In the most recent CAR for MATH 181, this outcome was addressed using a four part question that required students to use concepts from calculus as applied to a graph. 51% percent of students answered this part . The feedback from the closing of the loop discussions is to use more graphical approaches to questions to reinforce this concept throughout the course, such as questions that ask student interpret and average rate of change of a function and an instantaneous rate of change of a function. We could also include a part where students could enter a free response to justify their calculations. This would allow instructors to get feedback on the errors performed in the interpretation, which are unclear in the responses as the question was written. Since this is the first required course in the sequence for an AS in Mathematics, the outcome of this CSLO directly maps to this PSLO.

2. Course #2: MATH 283: The student will interpret geometrically derivatives and integrals of functions of several variables.

1. This outcomes was measured using a problem where the student was to use a graph to determine whether circulation is +/-/0 and determine whether the vector field is conservative. 74% of the students answered this correctly. Performance on this outcome was satisfactory. Since, MATH 283 is the third course of our program sequence, and this outcome is a reflection of graphical interpretation. This outcome mapped to our PLSO.

2. Program Student Learning Outcome #2: Select and apply the appropriate algorithm or methodology to solve mathematical problems.

1. Course #1: MATH 181: The student will be able to apply the fundamental theorem of calculus.

1. The results of this SLO show that 44% of the Math 181 students could use the Fundamental Theorem of Calculus correctly to compute a integral using basic integration techniques learned in the last chapter of the course. The common errors were that students differentiated instead of integrating. These errors often occur because students use techniques of differentiation for the majority of that course and often learn the Fundamental Theorem of Calculus near the very end of the course. Some students made arithmetic errors.

This outcome maps to the PSLO because students have to select and apply the appropriate integration technique to compute the integral correctly. Since this is the first course of our program, and since this topic is threaded throughout the rest of the course sequence, it is an important SLO to measure. Per the department closing of the loop discussion, we plan to continue to assess this CSLO and in this same comptuational manner. The reason there will be no changes to how we assess this CSLO is the topic is the irst topic utilized in MATH 182. Thus, the department needs to continue to get students to at least a proficient level on this CSLO for those students to be successful in MATH 182.

2. Course #2: MATH 182: The student will evaluate indefinite and definite integrals be selecting and correctly applying appropriate integration techniques.

1. The results showed that students could use the correct techniques at an acceptable level. The weakness appeared in the execution of the technique, this is, in the actual algebraic and computational details needed to arrive at a correct answer. This is a generally a weakness across this course since the computations are learned at at an elevated algebraic level. These details can be difficult for students to organize and minor algebraic or computational error can have a drastic difference on the result. To improve the teaching of computational method of techniques of integration and integration in general as it applies to MATH 181 and MATH 182, the first two courses of the AS in Mathematics, it was discussed among the faculty to add a little more time to the most complicated techniques, such as the substitution method in MATH 181, to emphasize ways to check final results.

3. Program Student Learning Outcome #3: Use deductive reasoning to construct mathematical proofs.

1. Course #1: MATH 182: Students will utilize appropriate theory and computational techniques to construct Taylor series with its interval of convergence for use in a variety of applications such as approximating values of a function, creating series for a new functions, and study behavior of a function.

1. The results showed that students, in large part, did not have the ability to construct a Taylor series except in relatively elementary cases where substitution of a known series was involved. This technique can be accomplished through memorization, and not through a true reasoning process and application process. The results of the assessment showed that more time needs to be spent on developing essential concepts for student to be able to meet this outcome. Although plenty of time is spent on testing series, often this more important capstone outcomes for MATH 182 is given insufficient time.

Do you use any other assessment tools, such as cumulative licensure exams, to assess PSLOs? If so, please summarize the most significant PSLO assessment results and plans that were implemented to try and improve teaching and learning.
No
Were there any courses and CSLOs that did not align well to current PSLOs? If so, please list them.
Here is a mapping of our CSLO's and our PSLO's. It seems that almost all our CSLO's map to our PSLO's, but the department should revisit the PSLO's to make sure they are properly threaded throughout our courses from an introductory level in MATH 181 to a level of demonstration as the student near the end of the degree in the higher-level ath courses. In particular, the PSLO #3 Use deductive reasoning to construct mathematical proofs, is just introduced briefly in MATH 182. As a program, it seems we are not properly integrating this PSLO into our calculus sequence. Either we need to revise this PSLO to one that we can thread throughout our course sequence, or we need to discuss the curriculum and implement more proofs into our courses. Also, PSLO #1 is only introduced in MATH 181 and then not practiced again until MATH 283. Hence, the department should look into revising the curriculum of MATH 182 to allow either more introduction to the PSLO or allow students to practice the PSLO through more applications. MATH 182 is a very computational and abstract course, but could be revised to include more applications that will align the flow of concepts from MATH 182 to MATH 283.

	Communicate mathematical information formally through appropriate notation, terminology, and graphical representation as well as communicate mathematical ideas informally using everyday language.	Select and apply the appropriate algorithm or methodology to solve mathematical problems.	Use deductive reasoning to construct mathematical proofs.
MATH181 - Calculus I			
The student will apply the fundamental theorem of calculus.		Introduced	
The student will compute and interpret average rate of change and instantaneous rate of change for functions.	Introduced		
The student will interpret the derivative of a function graphically, numerically and analytically.	Introduced		
MATH182 - Calculus II			

Students will develop an appropriate integral form to solve a specific applied problem in geometry, physics, or probability.		Practiced	
Students will evaluate indefinite and definite integrals by selecting and correctly applying appropriate integration technique,(s).		Practiced	
Students will utilize appropriate theory and computational techniques to construct Taylor series with its interval of convergence for use in a variety of applications such as approximating values of a function, creating series for new functions, and study			Introduced
MATH283 - Calculus III			
Students will apply the techniques of multivariable calculus to problem in mathematics, the physical sciences, and engineering.		Practiced	
Students will compute derivatives and integrals of real valued and vector valued functions of several variables.		Practiced	
Students will interpret geometrically the derivatives and integrals of real valued and vector valued functions of several variables.	Practiced/Demonstrated		
MATH285 - Differential Equations			
Students will formulate models of natural phenomena using differential equations.	Practice/Demonstrated		
Students will interpret a differential equation qualitatively.	Demonstrate		
Students will solve a variety of differential equations analytically and numerically.		Demonstrate	

What is the evidence of student learning in the program as a result of General Education assessment? Please review past general education assessment reports (GEARs) and follow the outline below:

1. **Program Student Learning Outcome (PSLO)**
   1. **List a course and General Education SLO that aligns to this PSLO**
      1. **Summarize the most significant General Education SLO assessment results and subsequent plans that were implemented to try and improve teaching and learning.**
   2. **List a second course and General Education SLO that aligns to this PSLO**
      1. **Summarize the most significant General Education SLO assessment results and subsequent plans that were implemented to try and improve teaching and learning.**
   3. *Repeat until all courses and General Education SLOs that map to this PSLO are included . . .*
      1. *Repeat until all assessment result and improvement plan summaries are complete. . .*

The GEAR for MATH 181 is the only GEAR of our Program that we have submitted during this review period. Math 181 is the first course of the MATH AS Degree offered at TMCC.

Our assessment results show that on Critical Thinking, Student Learning Outcome #6, Students will draw a valid conclusion, only 12% of our students scored exemplary, while 30% scored proficient and 39% scored marginally, and 19% scored unacceptable. The assessment was conducted using a project developed among the MATH 181 instructors that requires the students to apply the concept of the derivative to optimization, to perform a higher level of calculus computational skills, as well as, to make a strong conclusion based on the results of their calculations. One recent project asked students to maximize the volume of can while holding its surface area as a constant, and then to minimize the surface area while holding the volume constant and compare and contrast the results. In our closing of the loop discussions, the department agreed that since MATH 181 is the first course of our program, this is often the first time students are presented with a project such as this. In addition, this is the first time students start to truly apply what they learn in the course to a real life application that requires more difficult computations as well as drawing a valid conclusion. Hence, the results showing that 69% of the student could at least perform at the Proficient to Marginal level implies that the students can start this type of application, but perhaps are not prepared to fully comprehend the whole project or have the ability yet to write up the solution and conclusion at an Exemplary level.

On Quantitative Reasoning, our MATH 181 results showed more students can perform at an Exemplary to Proficient level. Specifically, 21% scored exemplary. This means that these students could completely perform and present the mathematics to the project correctly and thoroughly. \47% scored as Proficient. This meant that either their solution was not complete or was on the correct track or had minor errors. Overall, this shows that in our beginning Calculus class, 67% of our students can perform appropriate mathematical calculations to obtain a correct solution at a high level. This is one example of evidence that our course sequence prior to calculus is preparing students well for computation mathematics. From our Critical Thinking results, we see that we are not preparing our students as well for higher level analysis of mathematical computation.

In our MATH 181 GEAR closing of the loop results we agreed as a department we would include more critical thinking problems on homework and not only focus on mechanics as is often done in our courses. Also, we would require students to explain their results, allowing students more opportunities to analyze their mathematical results, instead of just boxing an answer, without interpreting its meaning in context of the problem.

Do you use any other assessment tools, such as cumulative licensure exams, to assess General Education SLOs? If so, please summarize the most significant assessment results and plans that were implemented to try and improve teaching and learning.

No

Were there any General Education SLOs that did not align well to current PSLOs? If so, please list them.

Our course level assessment maps to our program outcomes namely through our Calculus sequence. The GE learning outcomes of MATH 181 map to our program learning outcomes. We assess two GE outcomes - critical thinking and quantitative reasoning. Our first program outcome -" Communicate mathematical information formally through appropriate notation, terminology, and graphical representation as well as communicate mathematical ideas informally using everyday language" is really the heart of what we do in the classroom. We try to connect the formal math to everyday uses for our students to help them see the connections. One benefit of doing this is that it can help them retain the new concepts. Our second program outcome, "Use deductive reasoning to construct mathematical proofs" is assessed only in our upper division Calculus classes. There is minor exposure to proofs in Math 181, and much more exposure in MATH 182, 283, and 285. Further, the department is adopting two new courses. One of them is MATH 295 - an introduction to proofs. The other is MATH 330 - Linear Algebra. These two courses will help students in our program to develop a more formal understanding of mathematical proofs. It has not been decided if these courses will be part of our degree, or if they will be offered since UNR now makes them required of students in their second year. Hence, TMCC was given permission to also offer them. That way, students can complete them at TMCC and transfer directly into their third year at UNR without having to lose a semester of time taking these courses. Our mapping of our CSLO's to our PSLO's shows that we have some disconnect between the two sets of outcomes. It would benefial for the department to revisit our PSLO's to rewrite them so they are threaded more thoroughly thouroughout our course sequence.

Additional Assessment Levels : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

Is the department or unit conducting any other levels of assessment, such as assessing gateway and pre-requisite courses for other programs as a group? If so, please summarize the most significant assessment results and subsequent plans to improve teaching and learning.

The department is looking at assessment in MATH 126 this semester. This course is a primary course for students either continuing in our program, or using it as a prerequisite for many other programs on campus. We also are looking into how students do in our developmental courses moving into a college-level course. Office of Institutional Research gave us the following data i on these students.

Average number of terms to degree earned (First Term to Grad Term)

	2014-15*	2015-16	2016-17	2017-18
Completed Math 126 within first year (or prior)	4.7	4.6	5.0	5.1
Completed Math 126 after first year	6.6	6.8	7.5	6.8

Math Course Pass Rates
Fall 2013 - Spring 2018
Math 96

	Enrolled	Retained	Course Pass Rate
Passed Math 95 at TMCC	2949	2357	80%
Did not take Math 95 at TMCC	4565	3507	77%

Math 126

	Enrolled	Retained	Course Pass Rate
Passed Math 96 at TMCC	4376	3279	75%
Did not take Math 96 at TMCC	2330	1775	76%

From this, we can see that if students complete Math 126 within their first year, then they graduate on average 2 semesters earlier compared to students that do not. Our main focus this year has been getting students effectively into a Math 126 course since the data shows they will graduate at a faster rate. Of those students that qualified to take Math 126 this semester, the department, along with efforts across campus, were able to get 76% of this cohort into a Gateway math course. The Math Department will continue to implement this gateway initiative to get students to complete their gateway math course within their first year. This will not be an easy task, since we find many students do not come in unprepared for the rigor of a college-level precalculus mainly. We will continue to look at the effects of alternative placement of students into Math 126 to see if these students are successful at an acceptable rate. We do not find the same issues in Math 120. Also, the department recently changed the prerequisite for Math 120 to B or better in Math 095 solely to help those students that only need Math 120 for their program requirement.

Course Review : Version by **Deadmond, Melissa** on **09/05/2018 19:12**

Course	Last Time Course Had Enrollments	Do you plan to review and update or delete course?	Semester you will submit to CRC for review or deletion
MATH 90 - Continuing Studies in Math	Spring 2012	undefined	undefined

Course Assessment Cycle : Version by **Jensen, Lars** on **11/08/2018 20:41**

Discrepancies between above elumen Course Assessment Cycle Table, and the department's Assessment Cycle Table

1. No data are available in elumen (above table) regarding when MATH 96A and MATH 96D will be assessed. The department's Assessment Cycle Table does include these courses, but it does not include an assessment schedule for them.
2. No data are available in elumen (above table) regarding when MATH 176 will be assessed. The department's Assessment Cycle Table does include this course, but it does not include an assessment schedule for it.
3. No data are available in elumen (above table) regarding when MATH 181 will be assessed. The department's Assessment Cycle Table does include this course, but it does not include an assessment schedule for it.
4. SKC 80, SKC 85, and SKC 86 are missing in above table. The department's Assessment Cycle Table does include these courses, but it does not include an assessment schedule for them.
5. MATH 19 and MATH 90 are not listed in the department's Assessment Cycle Table, so we don't have any assessment schedule for these courses.

Course Learning Outcome	Semester to be Assessed, or Assessed "As Taught"
MATH19 - Fundamentals of College Mathematics I	(No data available)
Formulate and use mathematical models to analyze real-world situations.	(No data available)
Determine and implement an appropriate method of solution for financial problems.	(No data available)
Solve basic probability problems.	(No data available)
MATH90 - Continuing Studies in Math	(No data available)
Students will perform the fundamental elementary algebra operation to place into MATH 095.	(No data available)
Students will perform the fundamental intermediate algebra operations to place into MATH 096.	(No data available)
MATH92 - Algebra Review	As Taught
Students will demonstrate the ability to solve basic algebra problems.	As Taught
MATH95 - Elementary Algebra	S'20
Students will form and graph linear equations in two variables.	S'20
Students will form and solve linear equations in one variable.	S'20
Students will simplify and evaluate algebraic expressions.	S'20
MATH96 - Intermediate Algebra	S'20
Students will simplify and perform operations with nonlinear expressions.	S'20
Students will solve nonlinear equations using analytic methods.	S'20

Course Learning Outcome	Semester to be Assessed, or Assessed "As Taught"
Students will use mathematical concepts in real world situations.	S'20
MATH100 - Math for Allied Health Programs	S'22
Students will apply ratio and proportion to problems in health sciences.	S'22
Students will compute dosages.	S'22
Students will convert between metric, household and Apothecary units.	S'22
MATH105 - Applied Topics in Math	S'22
Students will apply basic algebra and geometry to problems in radiological science.	S'22
Students will convert between metric and English system units.	S'22
Students will use proportions to solve basic problems in radiology.	S'22
MATH106 - Geometry	S'22
Students will construct simple geometric proofs.	S'22
Students will demonstrate knowledge of the basic concepts of Euclidean geometry.	S'22
Students will do basic geometrical constructions with a straight edge and ruler.	S'22
MATH107 - Real Estate Math	S'22
Students will compute taxes and commissions on a property sale.	S'22
Students will compute the appreciation and depreciation in property values.	S'22
Students will use percentages to solve real estate problems.	S'22
MATH108 - Math for Technicians	S'22
Students will apply trigonometry and basic geometry to technical problems.	S'22
Students will convert between metric and standard units of measurement.	S'22
Students will solve applied technical problems using ratios and proportions and simple algebra.	S'22
MATH120 - Fundamentals of College Mathematics	S'21
Students will solve basic problems in probability and statistics.	S'21
Students will solve exponential growth and decay problems.	S'21
Students will solve financial math problems.	S'21
MATH122 - Number Concepts for Elementary School Teachers	S'22
Students will communicate their mathematical thinking coherently and clearly to students, peers and others.	S'22
Students will understand numbers, way of representing numbers, relationships among numbers and number systems.	S'22
Students will use mathematical models to represent and understand quantitative relationships.	S'22
MATH123 - Statistical & Geometrical Concepts for Elementary School Teachers	F'22
Students will measure/calculate length, perimeter, capacity, weight, area volume, time, temperature and angle measures.	F'22
Students will perform Euclidean constructions.	F'22
Students will relate geometric ideas to number and measurement ideas.	F'22
MATH126 - Pre-Calculus I	S'20
Students will algebraically analyze functions.	S'20
Students will graphically analyze functions.	S'20
Students will model real-life scenarios using functions.	S'20
MATH127 - Pre-Calculus II	S'22
Students will convert between polar and Cartesian representations of points, graphs, and equations.	S'22
Students will prove trigonometric identities.	S'22
Students will solve equations involving trigonometric functions.	S'22
MATH176 - Introductory Calculus for Business and Social Sciences	(No data available)
Students will approximate and compute derivatives and integrals of functions of one variable.	(No data available)
Students will interpret the concepts of calculus geometrically.	(No data available)
Students will interpret the concepts of calculus in terms of models of natural and economic behavior.	(No data available)
MATH181 - Calculus I	(No data available)
The student will apply the fundamental theorem of calculus.	(No data available)
The student will compute and interpret average rate of change and instantaneous rate of change for functions.	(No data available)

Course Learning Outcome	Semester to be Assessed, or Assessed "As Taught"
The student will interpret the derivative of a function graphically, numerically and analytically.	(No data available)
MATH182 - Calculus II	S'20
Students will develop an appropriate integral form to solve a specific applied problem in geometry, physics, or probability.	S'20
Students will evaluate indefinite and definite integrals by selecting and correctly applying appropriate integration technique,(s).	S'20
Students will utilize appropriate theory and computational techniques to construct Taylor series with its interval of convergence for use in a variety of applications such as approximating values of a function, creating series for new functions, and study	S'20
MATH283 - Calculus III	S'21
Students will apply the techniques of multivariable calculus to problem in mathematics, the physical sciences, and engineering.	S'21
Students will compute derivatives and integrals of real valued and vector valued functions of several variables.	S'21
Students will interpret geometrically the derivatives and integrals of real valued and vector valued functions of several variables.	S'21
MATH285 - Differential Equations	S'21
Students will formulate models of natural phenomena using differential equations.	S'21
Students will interpret a differential equation qualitatively.	S'21
Students will solve a variety of differential equations analytically and numerically.	S'21
MATH96A - Intermediate Algebra - Basic Properties	(No data available)
Students will solve nonlinear equations using analytic methods.	(No data available)
Students will apply relevant mathematics concepts in real world applications.	(No data available)
Students will simplify and perform operations with nonlinear expressions	(No data available)
MATH96D - Algebra Review for Math 126	(No data available)
Students will solve nonlinear equations using analytic methods.	(No data available)
Students will use mathematics concepts in real world applications.	(No data available)
Students will perform operations with nonlinear expressions.	(No data available)
MATH120E - MATH 120 Expanded	S'23
Students will solve and interpret basic problems involving probability and statistics.	S'23
Students will solve and interpret exponential growth and decay problems.	S'23
Students will solve financial math problems and interpret the solution.	S'23
MATH126E - Math 126 Expanded	S'23
Students will algebraically analyze functions.	S'23
Students will graphically analyze functions.	S'23
Students will model and interpret real-life scenarios using functions.	S'23
STAT152 - Introduction to Statistics	S'21
Students will analyze sampling distributions by calculating and interpreting descriptive statistics, and by appropriately showing a graphical display of the distribution.	S'21
Students will carry out a linear regression analysis by computing and interpreting the correlation coefficient and the least squares line of regression to predict values, interpret slope, identify outliers, and identify influential points.	S'21
Students will describe a sampling distribution, carry out a hypothesis test about a population mean, and explain the conclusion of the hypothesis test.	S'21

Curriculum Strategies : Version by **Winston, James** on **11/24/2018 11:54**

Using the most significant curriculum and assessment-driven findings, discuss strategies to sustain or improve the quality of your program(s) going forward. This may also include deactivation of existing programs or introduction of new programs to meet student and/or industry demand.
To improve student learning at the program level, the department is currently using small focus groups to evaluate our curriculum. The group started with the first course in our developmental program, MATH 095. They are creating points of emphasis for all instructors to use as well as important examples for the department to use to better align the topics and meta skills needed to be successful in the course and the subsequent courses. Eventually, we will complete this task for all our courses, and use this to better build our assessment tools.

With respect to our most significant findings, it seems the department would benefit from a realignment of PSLO's to our CLSO's of those courses in our program. Or, discuss the option of deactivating the Math AS, since this AS only account for a very small portion of the students we serve. The bulk of the students are fulfiling prgram requirement for other degrees. As a deparmement, we need to discuss realigning the curriculum or refocusing our program as a service program.

Are there any internal or external factors anticipated to impact future curriculum development or offerings? If so, how does the department/unit plan address these factors?

The department is adopting two new courses. One of them is MATH 295 - an introduction to proofs. The other is MATH 330 - Linear Algebra. These two courses will help students in our program to develop a more formal understanding of mathematical proofs. It is being discussed as to whether or not they will be included in our Math AS. The reason to offer these course was a change in the program at UNR. UNR now requires these two courses to be taken in the second year. TMCC was given permission to then offer these courses so our student could tranfer directly into their third year of the program at UNR and not have to take an extra semester to complete these courses.

V. ENROLLMENT AND DEMOGRAPHICS

FTE, Section Count, and Course Fill Rate : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Enrollment in MATH Sections			
Fall Term	FTE	Section Count	Avg. Course Fill Rate
Fall 13	618.8	128	92%
Fall 14	624.0	130	93%
Fall 15	656.6	132	92%
Fall 16	684.8	143	91%
Fall 17	663.3	140	91%

	5 yr change / average		
	FTE	Section Count	Avg. Course Fill Rate
MATH	7%	9%	92%
Division	4%	10%	85%
TMCC	-4%	6%	77%

Please discuss the trends you see, including how they compare to those of the division and College. What might these trends or shifts mean? Discuss any factors that could have led to significant trends or shifts in enrollment and sections offered.

FTE and section counts are up in the math department. Even though the number of sections has increased, our fill rates remain high. In fact, our fill rates are substantially higher than the division and TMCC. Math's FTE has risen even though TMCC's overall FTE is down. Overall, math continues to offer more classes and that they continually fill. These trends can be an indication of several things. For example, there could be more incoming students who are interested in science-based majors. This may be because of the rising tech jobs coming to our area. This could also be an indication that students are less prepared for college math as they come out of high school, which forces them to take more math courses as they try to meet prerequisite standards.

Unsuccessful Enrollment Attempts : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Unsuccessful Enrollment Attempts		
Course	5 yr average fill rate	5 yr average # of Unsuccessful Enrollment Attempts
MATH092	81%	22.88
MATH095	94%	84.00
MATH096	95%	132.30
MATH096A	33%	0.00
MATH096D	73%	7.00
MATH100	62%	1.33
MATH105	77%	0.00
MATH105R	71%	3.33
MATH106	75%	2.00
MATH107	79%	2.00
MATH108	85%	2.00
MATH120	78%	26.30
MATH120E	33%	0.00
MATH122	68%	0.00
MATH123	64%	3.00
MATH126	88%	192.20
MATH126E	73%	8.50
MATH127	81%	41.30
MATH176	87%	18.78
MATH181	93%	31.60
MATH182	90%	15.89
MATH283	95%	12.17
MATH285	85%	3.00

Please discuss the trends or shifts you see. What might these trends or shifts mean? Discuss any factors that could have led to significant trends or shifts in course fill rate and unsuccessful enrollment attempts.

The math sequence 95-96-126 shows some of the highest fill rates as well as the most unsuccessful enrollment attempts. This could be due to the fact that most majors require some, if not all, of these courses. Incoming students are allowed to take placement tests to determine which math class they should take. Most students don't take advantage of this until right before the semester begins. This could explain the high number of unsuccessful enrollment attempts, as many of the classes are full by the time the semester begins. The math department has been adding late-start classes which could help alleviate these unsuccessful enrollment attempts. We seem to be adequately meeting the needs of students in the other classes.

Evidence of Student-Centered Scheduling : Version by **Lambert, Theodore** on **10/12/2018 17:37**

Describe your department/unit's scheduling and faculty teaching assignment practices. Using the enrollment data provided in the previous sections and/or other data within your department/unit, what is the evidence that the department/unit engages in student-centered and equitable scheduling?

The math department devolops a schedule based on student demand prior to assigning faculty to classes. Our scheduling process is entirely student-centered.

Over the past 5 years, the department has a 7% increase in FTE enrollment while the college as a whole dropped 4%. The department has increased 9% in sections offered while successfully maintaining 92% average course filled rate. To accommodate students' needs, we have increased our late start sections. We have added the Skills and Drills course to refresh students before the beginning of a semester. We have added Math 95 online to provide an option for our second 7-week students. We have added Math 19/119 sequence to accommodate our students who qualify for ADA services. We are in the process of adding Math 295 and Math 330 to service our transfer students better.

Student Demographics: Credit Load, Status, Age, Gender, and Ethnicity : Version by **Clifford, Donna** on **08/14/2019 21:08**

Demographics of MATH Majors			
	Fall 13	Fall 17	% Change
MATH-AS	38	36	-5%
Total	38	36	-5%
TMCC Headcount	11686	11110	-5%

Fall 2017					
Credit Load	MATH Majors	TMCC	**Status**	MATH Majors	TMCC
part-time	58.3%	72.3%	New	25.0%	14.0%
full-time	41.7%	27.2%	New Transfer	8.3%	9.9%
			New High School	0.0%	3.8%
			Continuing	66.7%	69.8%
			Cont. High School	0.0%	2.5%
Age	MATH Majors	TMCC	**Gender**	MATH Majors	TMCC
under 18	0.0%	5.5%	female	33.3%	53.7%
18-24 yrs	75.0%	56.3%	male	66.7%	46.3%
25-34 yrs	13.9%	23.8%			
35-49 yrs	11.1%	10.3%			
50+ yrs	0.0%	4.4%			
Ethnicity	MATH Majors	TMCC			
International	0.0%	0.4%			
Native Am	2.8%	1.3%			
Asian	5.6%	6.0%			
Black	2.8%	2.5%			
Hispanic	38.9%	28.8%			
Hawaiian/PI	0.0%	0.1%			
2+ Races	5.6%	3.5%			
Unreported	0.0%	1.7%			
White	44.4%	55.7%			

Briefly describe the typical student profile in terms of credit load, status, age, gender, and ethnicity in your program/unit. In cases where the demographics of your students noticeably differ from those of all TMCC students, please discuss the reasons as you understand them. Please note any potential underserved student populations.

From the data above, we see a larger percentage of full-time math majors (41.7%) versus the college as a whole (27.2). This could be due to the fact that many math majors enroll in college directly or soon after high school to pursue their goal of earning a degree and advancing into the workplace. This reason also reflects the larger percentage of math majors (75%) versus the college as a whole (56.3%) in the 18 – 24 year age range, as well as the lower percentage in the 50+ age range. In terms of ethnicity, math students percentages are comparable to those of the college with the exception of a significant increase in the Hispanic group. This is due the department's effort to increase enrollment from this particular underrepresented group since the previous PUR. One other noticeable difference is the dominance of male math majors to female. Enrollment in the college is fairly equal in genders. However, females are underrepresented in STEM on the national scale. TMCC female math majors (33.3%) is below the national average (43.1%) (2012 data, www.nsf.gov).

Student Recruitment Activities : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Describe any recruitment activities in which the program/unit participates. These may include campus events such as Day on the Hill, external events, or special activities organized by the program/unit. If applicable, describe any partnerships with local high schools or efforts to help high school students enter the program. These might include Career and Technical Education (CTE) agreements, assisting or offering courses for JumpStart, accepting or offering credit by examination, etc. To the best of your knowledge, have these recruiting efforts been successful?

The Mathematics Department is involved in several recruitment activities, campus events, and outreach to get accurate information out to interested students and to help students succeed in the program. The department works with the Summer Bridge Program to help prepare students for success in college as well as their math classes. Members of the department work closely with Academic Advising to maintain accurate and up to date information regarding our course offerings. This is a critical component to getting students enrolled in the right math classes that meet their needs and gives them the greatest possibility of success. The department similarly works with the Testing Center to make sure students understand their placement test results. Pamphlets have been created with information for students regarding our course offerings and the accurate sequence of math classes. This has been helpful as students often incorrectly assume Math 120 must be taken before Math 126. Students are able to get this information on the pamphlet or on the Math Department website. "Take the Right Math Class" is accessible on the website as well as placement information for each class and test preparation material. All of this material helps students prepare for their math classes, register for the correct class, and enroll in the subsequent math class. Posters have also been created and distributed around campus with updated offerings like our Math 95 with a B or better as a prerequisite into Math 120. The Skills Center and the Math Department share a table at the Welcome Fair to distribute information to students. Math classes are offered in a variety of formats including: Mini-Session, Online, Hybrid, Late Start, and Stretch. Classes are also offered early morning, afternoon and during the evening. This helps the department reach a wider variety of students who are able to take a math class that fits their life and scheduling demands. The department also work with the local high schools to maintain consistent curriculum in their Math 95/96 classes. This allows students to enter TMCC prepared to take a 100-level math class. Students are also able to take the Accuplacer during their Junior year in high school. This allows them to take Math 95/96 during their senior year or know which math class they will be able to register for when they enroll at TMCC. The Math Department offers students multiple options for placement into a math class including the Accuplacer Exam, ACT/SAT scores, Challenge Exams, and a combination of high school GPA and Algebra course grade. All of these activities have helped recruit students and get them into the correct math classes and keep them on the right path towards successful completion of their math requirements.

Enrollment Strategies : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Regarding the most significant enrollment findings, discuss strategies, if needed, to improve enrollment in your program(s)/unit. These may include improving recruitment efforts, especially to underserved students, more efficient scheduling, streamlining pathways to completion, etc. Include an estimated timeline of proposed actions.

The classes taught in the Mathematics Department are either developmental classes or service classes required by a wide range of degree and certificate programs at TMCC. As a result, recruitment is less of an issue than scheduling. In light of the recent Gateway policy implemented by the NSHE, the Mathematics Department faces serious challenges in ensuring that degree seekers are able to meet the requirement of finishing a college level course within two semesters after enrolling at TMCC. The Math Department has submitted two new classes for approval. Recruitment efforts for these classes will be discussed at the end of this subsection.

The most serious challenge faced by the Mathematics Department in enrollment strategies is in scheduling classes so that students can meet the NSHE Gateway requirements. Measures to ensure students needing courses, especially Math 96, Math 120, and Math 126, are being implemented immediately. Other strategies, such as the scheduling of second session mini-term classes, are also being implemented. Late start classes for students to fall back into will be scheduled for students who start a class and realize that they are underprepared for the level of the class.

In order to administer the new requirements and work with students on Gateway related issues, the Science Division has provided the department an additional administrative assistant. The Mathematics Department is carefully monitoring enrollment and data such as *unsuccessful attempts to enroll* in order to ensure that all students enrolling in degree programs satisfy the Gateway requirement.

Most Mathematics courses unaffected by the new Gateway requirements continue to grow in enrollment. The Mathematics department will continue to add offerings to meet demand. As an example, the offerings in Math 283 and Math 285 have recently been doubled.

The Mathematics department has recently submitted for approval the creation of two classes: Math 330 (Linear Algebra) and Math 295 (Theory of Proof). Math 330 is a service class taken by a variety of science and engineering majors and Math 295 is a course specifically designed for majors in mathematics. If approved, recruitment efforts will be channeled through our higher level classes (Math 283/5), our Tutoring Center, and our Student Math League. Initially, the goals will be to recruit one section of Math 330 and a small number of students to take Math 295 through independent study. At some point the department may consider replacing one class in the Math Emphasis with Math 295 as it is required for all University of Nevada, Reno mathematics and statistics majors.

Are there any internal or external factors anticipated to impact future enrollment? If so, how does the department/unit plan to address these factors?

As described above, the new Gateway requirements will impact enrollment in mathematics classes in a profound way. Some significant changes have already been implemented as of fall 2018. Students enrolled in gateway classes cannot drop or change to audit without permission from the Vice President of Academic Affairs. Any enrollment change must go through our new administrative assistant whose job it is to ensure that the Gateway requirements are met. The math department plans to monitor compliance with Gateway requirements closely and adjust course offerings to ensure that all requirements are met.

VI. STUDENT SUCCESS

Course Pass Rate : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Course Pass Rate in MATH Sections	
Fall Term	**Avg. Course Pass Rate**
Fall 13	71%
Fall 14	69%
Fall 15	69%
Fall 16	66%
Fall 17	67%
5 yr change / average	**Avg. Course Pass Rate**
MATH	68%
Division	79%
TMCC	80%

Please describe any substantial trends or shifts that you see. What might these trends or shifts mean? Discuss any factors that could have led to these trends or shifts in the data.

Over the years, the Math Department has mainly seen a pass rate that stays somewhere in the 60's, so it is not surprising to see the numbers in the table. The 71% pass rate is actually relatively high, but also an improvement from previous years. One of the reasons for the lower average course pass rates in Fall 2016 and 2017 could be due to the new requirements the department was asked to implement regarding student placement and the Skills Center preparing some students to skip Math 95 and place into Math 96. Students are placing below Math 95, studying to take the Accuplacer, and many earn the lowest cut off score to get into Math 96. The department has advised against this, but students are still engaging in this practice.

The 5 year average does not appear to show any new trends or shifts for the Math Department in average course pass rate compared to the division or TMCC. Math tends to be one of the more difficult subjects for students to successfully complete, so it is not surprising to see a lower pass rate. However, as mentioned previously in the PUR, the department is trying to improve student success by increasing the variety of course offerings, changing the prerequisite for Math 120, and working with outside groups to make sure students enroll in the right class and are prepared to take the class they enroll in.

Graduation and Transfer : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Degrees Awarded		
AY	MATH-AS	Total
12-13	2	2
13-14	6	6
14-15	4	4
15-16	2	2
16-17	6	6
Total	20	20

Transfer Rate of Grads			
	Program	Transfer Degrees	Terminal Degrees
Degrees Earned Fall 12 - Summer 17	20	4128	2805
# Transferred after graduation	15	2455	821
% Transferred after graduation	75%	59%	29%

Transfer Schools	
# of students	Transfer Institution
1	Missouri University of Science and Technology
1	University of Minnesota - Twin Cities
1	University of Nevada, Las Vegas
11	University of Nevada, Reno
1	University of Washington - Seattle

Please discuss any trends or shifts that you see. Do your degrees and/or certificates appear to be preparing students to transfer or enter directly into the workforce as intended?
Not many students at TMCC pursue a Mathematics A.S. degree. The transfer rate of our degree-awarded students is much higher than the rest of the college, although we have a smaller sample size. Our Mathematics A.S. degree is a very good stepping-stone for students who are interested in engineering, computer science, etc. and our transfer rates indicate that these students are continuing their education.

Student Success Strategies : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

With respect to the student success indicators of credits earned (completion), retention, graduates and transfers, discuss strategies to enhance student success. These may include improving advising and mentoring efforts, improving retention efforts, streamlining pathways to completion, etc.
The department is using small focus groups to evaluate our curriculum. The group started with the first course in our developmental program, MATH 095. They are creating points of emphasis for all instructors to use as well as important examples for the department to use to better align the topics and meta-skills needed to be successful in the course and the subsequent course. Eventually, we will complete this task for all our courses, and use this to better build our assessment tools. Giving students more opportunities to analyze mathematical results, instead of just boxing an answer.
The project-oriented approach in our program will help students to see the big picture of real world mathematical problems. Going forward we are bringing two new courses to our program to improve quality and allow students to more seamlessly transfer to UNR. Those courses are MATH 295 and MATH 330.
Are there any internal or external factors anticipated to impact future student success in your program or unit? If so, how does the department/unit plan address these factors?

One other major external factor the department will monitor to see how it impacts sucess success are the NSHE Gateway Policy. The policy states that the Nevada System of Higher Education (NSHE) has prioritized math and English completion and has issued a policy *(Board of Regents Handbook (https://nshe.nevada.edu/leadership-policy/board-of-regents/handbook/), Title 4, Chapter 16, Section 1)* that requires students who want to earn a degree or certificate to complete their college-level math and English courses within two semesters after enrolling at TMCC. The policy is based on national data showing that students who complete their college-level math and English courses early have much higher rates of earning a degree. It is called the "Gateway" policy because math and English courses are gateways to success. To address this mandated policy the department has done the following:
   1. Worked in imporving advising of student to help students get in the correct math sequence from the beginning.
   2. Changed the prerequsite for Math 120 from Math 096 to a B or better in Math 095 to open up the Math 120 pathway for students directly from Math 095, which will shorten the length of time to complete Math 120 by a semester.
   3. The department is working on gettingmore classrooms to offer more classes at peak times so students are able to enroll in the math class they need.
   4. The department is also offering more late start and seven week 2 class offerings to allow students to enroll mid-semester or re-enroll in a gateway math course after a failed seven week 1 attempt. This allows students to still complete a gateway math course in a semester, even after a failed attempt.

VII. RESOURCES

Faculty Achievement : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Describe the program/unit's full-time (FT) faculty credentials, experience, and highlights of significant activities and/or contributions to TMCC. Please use the format below for each FT faculty member.
Faculty name
FTE
Degree(s) or professional certification(s) awarded, discipline, awarding institution
Significant accomplishments or examples of expertise outside of academia (Please try to limit to 3)
Number of years teaching at TMCC
Total number of years in academia
Primary courses taught
Significant activities or contributions made to TMCC (Please try to limit to 3)

Faculty name
. . .
1. Jim Cotter
FTE: 1
Degrees: BA, Philosophy, St. Louis University
                  M.Div., B.S.T., Regis College
                  PhD, Chemical Physics, University of Nevada, Reno
Accomplishments:
Years at TMCC: 25 years
Total teaching years: 28 years
Primary Courses: Math 91, 93, 95, 96, 120, 126, 127, 176, 181, STAT 151, Physics 100, 151
TMCC Contributions: Distinguished and long teaching career
                                    Helped thousands of students learn some thinking skills

2. Hieu Do
FTE: 1
Degrees: PhD, Mathematics, Oregon State University
              MS, Mathematics, Oregon State University
              BS, Mathematics, Eastern Oregon University
Accomplishments: Project ACCCESS fellow
                          Fluent in Vietnamese
                          USTA 3.5 Adult League District Champion (2017, 2018)
Years at TMCC: 3 years
Total teaching years: 10 years
Primary Courses: Math 96, Math 120, 126
TMCC Contributions: I-Club Advisor
                            Gen-Ed Assessment leader
                            Diversity Advocate

3. Kurt Ehlers
FTE: 1
Degrees: PhD, Mathematics, UC Santa Cruz
              MS, Mathematics, Hayward State University (now CSU East Bay)
              BS, Mathematics, US Naval Academy, Annapolis
Accomplishments: Naval Officer
Years at TMCC: 19
Total teaching years: 30
Primary Courses: Basic algebra, calculus, differential equations, options, math for elementary education
TMCC Contributions: Math League Advisor

4. Damien Ennis
FTE: 1
Degrees: PhD, Computer Science & Engineering, University of Nevada, Reno
              MS, Bioinformatics, Johns Hopkins University
              MS, Computer Science, University of Nevada, Reno
              BS, Mathematics, University of Nevada, Reno
Accomplishments: Development of several large-scale software application in the gaming and
                          public meeting domains
                          Co-author on 7 US patents
Years at TMCC: 10 years
Total teaching years: 10 years
Primary Courses: Math 181, Math 176, Math 120, Math 96
TMCC Contributions: Math Department Chair, 2015-2017
                              NISOD Teaching Excellence award winner
                              Software development of a math placement app

5. Paula Farrenkopf
FTE: 1
Degrees: MS, Pure and Applied Mathematics, Montclair State University
              BS, Mathematics, Computer Science, Secondary Education, Montclair State University
              Permanent Secondary Mathematics Certification, New Jersey
              Permanent Elementary Certification, New Jersey
Accomplishments: Brown belt in Taekwondo,

Hiked to top of Half Dome

Years at TMCC: 15 years
Total teaching years: 30 years
Primary Courses: Math 000L, 95, 96, 120 (different formats), 122, 123, 126 (different formats), 127
TMCC Contributions: Teacher of the Year Award from TMCC
                     NCTM presenter
                     Mathematics Department Part-Time Faculty Coordinator

6. Anne Flesher
FTE: 1
Degrees: MS, Mathematics, University of Colorado, Boulder
          BA, Major – Mathematics, Minor – Astronomy, University of Virginia
Accomplishments:
Years at TMCC: 14 years
Total teaching years: 18 years
Primary Courses: Calculus I, Calculus II, Precalculus I, Statistics
TMCC Contributions: Coordinator of the Tutoring and Learning Center (2005-2012)
                     Chair Academic Standards and Assessment Committee
                     Faculty Senate Chair Elect

7. Bill Gallegos
FTE: 1
Degrees: MS, Pure Mathematics, New Mexico State University
          BA, Mathematics, Secondary Education Certification, Adams State College
Accomplishments:
Years at TMCC: 18 years
Total teaching years: 26 years
Primary Courses:
TMCC Contributions:

8. Blisin Hestiyas
FTE: 1
Degrees: PhD, Crystallography, Madurai Kamaraj University, India
          MS, Physics, Manonmanian Sundaranar University, India
          BS, Physics, Madurai Kamaraj University, India
Accomplishments:
Years at TMCC: 13 years
Total teaching years: 21 years
Primary Courses:
TMCC Contributions:

9. Dan Hooper
FTE: 1
Degrees: MS, Mathematics, University of Utah
           MS, Mathematics, Washing State University
           BS, Mathematics, Eastern Washington University
Accomplishments: Research in Retina lab (biology experience)
                   Volunteering with NNVMath club
                   Passed Actuarial exam
Years at TMCC: 3 years
Total teaching years: 11 years
Primary Courses: Math 283, 96, 126, 95 120
TMCC Contributions: Creation of Math 95 on-line course
                     Service as chair of WCFAC
                     VP of NevMATYC

10. Lars Jensen
FTE: 1
Degrees: MS, Mathematics, University of Copenhagen
          PhD, Physics, University of Pennsylvania
Accomplishments:
Years at TMCC: 24 years
Total teaching years: 34 years
Primary Courses: Math 95 through 285
TMCC Contributions: Teaching courses
                    Introduced Engineering Physics Sequence to TMCC
                    Built Physics Lecture Demonstration Collection

11. Jonathan Lam
FTE: 1
Degrees: BS, Mathematics, minor: Economics, Chinese University of Hong Kong
         PhD, Mathematics (Number Theory), Ohio State University
Accomplishments:
Years at TMCC: 2.5 years
Total teaching years: 9 years
Primary Courses: Math 96, 126, 181
TMCC Contributions: Teaching classes

Chair of Placement Test Committee
Involvement with International Students

12. Ted Lambert
FTE: 1
Degrees: PhD, Operations Research, University of Michigan, Ann Arbor
          MS, Industrial and Operations Engineering, University of Michigan, Ann Arbor
          MS, Applied Mathematics, University of Nevada, Reno
          BS, Mathematics with Computer Science minor, University of Nevada, Reno
Accomplishments: Wrote and published College Math, Beginning Algebra, and Precalculus textbooks
                  NISOD Excellence Award recipient, 2011
Years at TMCC: 15 years
Total teaching years: 19 years
Primary Courses: Math 95, 96, 120, 126, 176, 181
TMCC Contributions: Created the Math Skills Center
                     Math department chair
                     Developed and taught pre-semester math Bootcamps

13. Casey Machen
FTE: 1
Degrees: PhD, Mathematics, Michigan State University
         MS, Mathematics, Michigan State University
         BS, Mathematics, University of Nevada, Reno
Accomplishments: Expertise in music (guitar)
Years at TMCC: 3 years
Total teaching years: 8 years
Primary Courses: Calculus
TMCC Contributions: Getting students interested in math

14. Rebecca McCleary
FTE: 1
Degrees: MS, Applied Mathematics, CSU East Bay
          BS, Mathematics, CSU Stanislaus
          Single Subject Teaching Credential (Mathematics), CSU Stanislaus
Accomplishments:
Years at TMCC: Presently in first year
Total teaching years: 11 years
Primary Courses: Math 95, 96, 120
TMCC Contributions:

15. Shannon McCool
FTE: 1
Degrees: MEd, Higher Education Administration, University of Nevada, Reno
         MS, Mathematics, University of Nevada, Reno
         BS, Education with Emphasis in Mathematics, University of Nevada, Reno
Accomplishments:
Years at TMCC: 14.5 years
Total teaching years: 18 years
Primary Courses: Beginning and Intermediate Algebra, College Math, College Algebra, PreCalculus
TMCC Contributions: Math Department Part-Time Faculty Coordinator
                      PTK Full Time Faculty of the Year

16. Bill Newhall
FTE: 1
Degrees: BS, Geology, University of California, Davis
           BS, Mechanical Engineering, University of California, Davis
Accomplishments: Industrial Engineering – Ralston Purina
Years at TMCC: 43 years
Primary Courses: Elementary and Intermediate Algebra; Basic Mathematics, Pre-Algebra,
                 Math for Nurses, Math for Radiologic Technicians, Real Estate Math, Geometry
                 Math for Technicians, Fundamentals of College Mathematics,
                 Introductory Calculus for Business and Social Sciences
TMCC Contributions: Mathematics Department Chair
                      Faculty Senate Chair
                      Nevada Faculty Alliance – President of the TMCC Affiliate

17. Jeff Olsen
FTE: 1
Degrees: PhD, Hydrogeology, University of Nevada, Reno
         MS, Mathematics, University of Oregon, Eugene
         MS, Civil Engineering, University of California, Davis
         BS, Mathematics and Environmental Resources Engineering, Humboldt State University
Accomplishments:
Years at TMCC: 15 years
Total teaching years: 18 years
Primary Courses: Math 95, 96, 126, 127
TMCC Contributions: Chair for the 2007 update of Accuplacer scores

Member of 2017 placement test study committee
Member of 95, 96, 126 committee working to define curricula for these courses

18. Becky Porter
FTE: 1
Degrees: MS, Mathematics, University of Nevada, Reno
            BS, Mathematics and English, University of Nevada, Reno
            Secondary Teaching Credential, Math/English, UNR
Accomplishments: Certification in Healing Touch for Animals
Years at TMCC: 35 years
Total teaching years: 42 years
Primary Courses: Math 93, 95, 96, 120, 126, 127, 181, 182, 183, 283
TMCC Contributions: Created the course outcomes and objective for Math 95, 96, 126
                    Studied how to use music to help student excel in mathematics
                    Served on many tenure and search committees

19. Gail Small
FTE: 1
Degrees: PhD, Geography, University of Nevada, Reno
            MA, Educational Psychology with emphasis in Marriage and Family Counseling, University of Nevada, Reno
            MA, Teaching of Mathematics, University of Nevada, Reno
            BA, Mathematics, Sand Diego State University
            Certificates in: Grief Recovery, 4MAT teaching styles, Student Success from Awarding organizations
Accomplishments: Founding Board member of Snowlands Network 501c3
                    Ongoing expert advocate in the NEPA process for winter recreation on public lands, as speaker, representative for human-powered winter recreation and educator in snow related education
                    Conducted Grief Recovery workshops for individuals
Years at TMCC: 26 years
Total teaching years: 30 years
Primary Courses: Math 91, 93, 95, 96, 126, 127, 181, 182, 283, 176, 120, Stat 152
TMCC Contributions: Three year grant from NSF for snow education, 2 year NSF grant teaching professors
                    About Reform Calculus
                    Math Department Chair, Faculty Senator, Lead instructor for several course
                    Nevada State Task Force on Developmental education
                    TMCC mathematics representative on Quality in Undergraduate Education
                    Received the Nevada Regents Teaching award and Phi Theta Kappa Teaching award

20. Shehara Snow
FTE: 1
Degrees: MS, Mathematics – Community College Emphasis, Northern Arizona University
            BS, Mathematical Sciences, University of Delaware
            AA, Mathematics Secondary Education, Delaware Technical Community College
Accomplishments:
Years at TMCC: Presently in first year
Total teaching years: 4 years
Primary Courses: Elementary Algebra, Precalculus I
TMCC Contributions:

21. Andrew Sumpton
FTE: 1
Degrees: MA, Philosophy, University of South Florida
            MA, Mathematics, University of South Florida
            BA, Philosophy and Cognitive Science, minor Mathematics, Tulane University
Accomplishments: First, North American Championships in Fireball dinghy (sailboat)
                    First, US Championships in Int. 470 Class dinghy (sailboat)
                    US Sailing Level 3 Racing Coach, USCG licensed Master 50GT
Years at TMCC: 3 ½ years
Total teaching years: 5 years
Primary Courses: Math 95, 96, 120, 126, 127, STAT
TMCC Contributions: Teach Jump-Start classes
                    Taught in Summer Bridge Program 2016, 2017, 2018

22. Jim Winston
FTE: 1
Degrees: BA, Applied Mathematics, UC Berkeley
            MA, Mathematics, San Jose State University
            MA, Philosophy, University of Nevada, Reno
            CA Single Subject Teaching Credential (Mathematics)
Accomplishments:
Years at TMCC: 33 years
Total teaching years: 40 years
Primary Courses: Math 90, 91, 93, 95, 96, 126, 127, 120, 181, 182
TMCC Contributions: Got the campus non-smoking (1989)
                    Department Chair (3 years)

1. Janet Bicker

	FTE:	1 – Administrative Assistant III
	Major Duties:	Office Management
		Faculty and Student Support
		Administrative Support
		Budget
	Credentials:	

2. Tina May
	FTE:	1
	Major Duties:	Assist mathematics administrative assistant, professors, and students
		Calling/contacting students with math questions
		Updating contact numbers for full and part time facility
		Helping with accuracy with Fall/Spring/Summer Schedules
		Ordering supplies when requested
		Making copies of finals for Math 95/96 and helping to distribute
		Helping with data input
		Creating forms in Excel
		Contacting students when courses are canceled
	Credentials:	BS, Biology, University of Nevada, Reno

3. Mayrely Perez
	FTE:	1 – Administrative Assistant II
	Major Duties:	Assist mathematics administrative assistant, professors, and students
		Assist students
		Maintain Gateway student folders, liaison for Gateway, maintain Gateway communication with college departments, follow-up with students
		Participate in trainings, understand and assist with PeopleSoft, Starfish, and other software platforms
		Assist with creating faculty contracts
		Compile data reports and complete research
		Assist with inventory equipment and supplies
		Prepare reports for department chair as directed

Faculty Workload : Version by **Farrenkopf, Paula** on **11/05/2018 19:45**

	Faculty FTE and Headcount			
	Full-Time		Part-Time	
	Headcount	FTE	Headcount	FTE
Fall 2013	16	17.5	24	8.3
Fall 2014	18	18.6	20	7.4
Fall 2015	17	18.3	19	8
Fall 2016	21	22.5	16	5.9
Fall 2017	20	21.7	20	6.3

	Student Credit Hours Taught			
	Full-Time		Part-Time	
	SCH	% SCH	SCH	% SCH
Fall 2013	6282	68%	3000	32%
Fall 2014	6858	73%	2502	27%
Fall 2015	7081	72%	2768	28%
Fall 2016	8360	81%	1912	19%
Fall 2017	7942.0	80%	2008	20%

Math (College and Developmental Instructors)

College & Dev	Full-Time (Your Dept)		Other Instructors	
	Headcount	FTE	FT	PT
Fall 2013	15	16.5	1	24
Fall 2014	17	17.6	1	20
Fall 2015	16	17.3	1	19
Fall 2016	20	21.5	1	16
Fall 2017	20	21.7	0	20

College	Full-Time (Your Dept)		Full-Time (other Dept)		Part-Time	
	SCH	% SCH	SCH	% SCH	SCH	% SCH
Fall 2013	3946	73%	0	0%	1464	27%
Fall 2014	4294	63%	519	8%	1980	29%
Fall 2015	4961	70%	453	6%	1698	24%
Fall 2016	5457	73%	486	7%	1523	20%
Fall 2017	5838	82%	0	0%	1281	18%

DEV	Full-Time (Your Dept)		Full-Time (other Dept)		Part-Time	
	SCH	% SCH	SCH	% SCH	SCH	% SCH
Fall 2013	2006	53%	330	9%	1464	39%
Fall 2014	2045	51%	0	0%	1980	49%
Fall 2015	1667	50%	0	0%	1698	50%
Fall 2016	2417	61%	0	0%	1523	39%
Fall 2017	2104	62%	0	0%	1281	38%

Describe the trends or shifts in the number of full-time (FT) and part-time (PT) faculty, and the number of student credit hours (SCH) taught by FT and PT faculty since the last program/unit review. What impact, if any, have these trends or shifts had on the program/unit?

At the time of the last program/unit review our department was roughly 60/40 compared to the college average of 53/47. Presently, using student credit hours our ratio of full-time to part-time is 80/20. Breaking the data into college level courses the ratio is 82/18 and developmental courses is 62/38. We are presently out of line with the college. The reason for the large gap of student credit hours data and college level course data is because we cannot find degree qualified part time instructors to teach 100 and above level courses. One of the reasons for this is, UNR pays part time instructors more than we do. UNR is also presently hiring more part time instructors to teach more of their courses, so we lose qualified part time instructors to UNR. One solution would be to pay math part time instructors the same rate of pay as UNR does.

Support Staff : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Describe the program/unit's support staff, including their FTE, major duties, and any specialized credentials necessary to carry out their duties. Is the number of staff adequate to support the program/unit? Explain.

Presently the Mathematics Department has two full-time administrative assistant positions (Janet Bicker - Administrative Assistant III, Mayrely Perez - Administrative Assistant II) and another position at 25% FTE (Tina May - Administrative Assistant II). Details are below. Presently this team of super-star administrative assistants is adequate for our program/unit needs. They are all well trained in handling the daily duties for the department along with meeting the needs of our students.

1. Janet Bicker - Administrative Assistant III
FTE: 1
Major Duties: Senior Office Manager
Faculty and Student Support
Department Chair Support
Financial Manager
Credentials: Associate of Applied Sciences
Computer and Office Technology, Emphasis Administrative Assistant

2. Mayrely Perez - Administrative Assistant II
FTE: 1
Major Duties: Liaison for Mathematics Gateway students, which includes data collection, trainings and communication
with college departments. Maintains processes through PeopleSoft, and other software platforms
Assist mathematics administrative assistant, professors, and students

3. Tina May - Administrative Assistant II
FTE: .25
Major Duties: Assist mathematics administrative assistant, professors, and students
Credentials: BS, Biology, University of Nevada, Reno

1. Janet Bicker
        FTE: 1 – Administrative Assistant III
        Major Duties: Office Management
                Faculty and Student Support
                Administrative Support
                Budget
        Credentials:

2. Tina May
        FTE: 1
        Major Duties: Assist mathematics administrative assistant, professors, and students
                    Calling/contacting students with math questions
                    Updating contact numbers for full and part time facility
                    Helping with accuracy with Fall/Spring/Summer Schedules
                    Ordering supplies when requested
                    Making copies of finals for Math 95/96 and helping to distribute
                    Helping with data input
                    Creating forms in Excel
                    Contacting students when courses are canceled
        Credentials: BS, Biology, University of Nevada, Reno

3. Mayrely Perez
        FTE: 1 – Administrative Assistant II
        Major Duties: Assist mathematics administrative assistant, professors, and students
                    Assist students
                    Maintain Gateway student folders, liaison for Gateway, maintain Gateway
                        communication with college departments, follow-up with students
                    Participate in trainings, understand and assist with PeopleSoft, Starfish,
                        and other software platforms
                    Assist with creating faculty contracts

Compile data reports and complete research
Assist with inventory equipment and supplies
Prepare reports for department chair as directed

Facilities and Technology : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

Describe the facilities and technology used by the program/unit, and discuss any unique requirements. These may include labs, studios, off-campus sites, computer classrooms, specialized equipment, etc.

Facilities

The Mathematics Department needs to maintain TIER 2 scheduling in VSTA 201, 202, 203, 100, 101 and 103. We also need to maintain this status with SIERRA 102, 103, 211, HTCR 116, and MDWS 102. We are also now using rooms in RDMT such as 403 and 404. Sierra 211 and RDMT 403 are TIER 2 classrooms which are designated for Gateway classrooms. We need this status due to our numerous types of class formats such as mini-sessions, hybrids, traditional lecture and classes which use ALEKS or other mathematical applications. We need these rooms along with more rooms during the high demand prime time of the day which students are requesting. Another issue that has caused challenges is the inadequate number of white boards available (numerous classes are taught in a flipped classroom format requiring student board use) and the projector screens should not cover any of the boards. In particular, the projector screen in classroom Sierra 102 covers the middle of the white board.

Jumpstart classes are held off campus in HTCR 116 for Galena High School, at Spanish Springs High School, and at the Edison Campus for AACT (Academy of Arts, Career, and Technology). Currently we have 3 Jumpstart classes. Requests for Fall 2019 are 6 Jump Start classes, including Reed High School and TMCC Meadowood Center.

Technology

The department uses a variety of classroom technologies to enhance the teaching of math courses at all levels. The table below provides a listing of the different technologies used by facutly.

- ActionPoint
- Adobe Pro
- ALEKS
- Calculators
    - Graphing calculators
    - Classroom set of calculators
    - TI Calculators
    - TI-84 Calculators
    - Casio Calculators
- CamScanner app (in both Android and Apple devices)
- Camtasia
- Canvas
- Computers (classroom and office desktop computers)
- CoreftpLe
- Desmos
- Dreamweaver
- GeoGebra
- Google Drive
- Google Sites
- Graph.exe
- Homework Assistant
- iBooks
- iBooks Authour
- IMPERIO software
- iPad
- Kaltura
- LaTex
    - Lyx
    - ShareLatex
    - Overleaf
- LibreOffice
- Livescribe
- Livescribe smart pen
- Mathematica
- Math Illustrations
- MathType
- Maxima
- Microsoft Excel
- Microsoft PowerPoint
- Microsoft Word
- MyMathLab
- MyOpenMath
- OneNote
- Quizdom software
- Smart-Classroom Technologies
    - Projectors (TMCC classroom projectors)
    - Pixie Controller
    - Elmo document camera
- TestGen
- Wacom tablet
- WebAssign
- WebWork
- WileyPlus
- Windows Snipping Tool

- WinEDT
- Wolfram Alpha

Are the program's/unit's facilities and technology adequate to support the program? Explain.
Facilities
As stated previously, we need more high tech, TIER 2 classrooms during high demand times. We also need classrooms which support technology. Presently, scheduling has been a challenge to meet the requirements of the needed classes during the times requested with properly degreed staff.

Technology
There is some technology requested by faculty as well as some changes in facilities and general situations. These are listed below:

New Techology Requested:
- Update classroom projectors (because they are dim and outdated)
- Modern inputs, like HDMI and/or miniDP
- Better lighting in classrooms, especially so that the lighting in the front of each classroom, particularly above the projector screens, can be dimmed while the rest of the classroom is still lit.
- SmartBoards (or the lesser desired SmartWalls) and SmartNotebook software
- Classroom iPads (or other similar tablets)

Facility Changes Requested:
- More office space/more offices
- More smart-classrooms
- Graders
- Centralized office space for all mathematics faculty
- Funds to pay for at least one more course coordinator. It is too much work for one person to coordinate more than one course.
- Screens placed to the side of the white boards and not in front of the white boards.
- Hire a department chair position (not a faculty member who is chair, but someone hired specifically to be chair).
- More whiteboards in classrooms
- More new design classrooms where students can stand and work together on white boards, such as on the new Pennington Redfield Heath Science campus on Mt. Rose Highway
- Student study rooms with smart-technology and computer hook-ups
- Another set of Quizdom clickers
- Graphing whiteboards or chalkboards with coordinate grids in classrooms

Funding and Instructional Expenditures : Version by **Lambert, Theodore** on **12/07/2018 18:43**

Working with your academic dean, describe the most significant funding source(s) and part-time faculty dollars allocated to the program/unit. These may include regular operating budgets, grants, lab fees, differential tuition, etc. Are funding sources adequate to maintain or grow the program? Should enhanced lab fees or differential tuition be explored?

Budget File:

Sciences Division -Math FY 2018/2019 Chair Ted Lambert			
	Accounts (Workday)	Programing Number	Amount
State Operating:	Developmental Math	PG07345	
	Hourly (student)		$0.00
	LOA Instructional Assist		$1,457.00
	Travel		$3,300.00
	Operating		$6,524.00
State Operating:	College Level Math	PG04039	
	Hourly (student)		$0.00
	LOA Instructional Assist		$0.00
	Travel		$3,300.00
	Operating		$12,198.00
Self Supporting	Math Lab Fees	PG02239	$3,692.91
Self Supporting	Math Challenge Exam	PG08193	$593.42

Discuss how part-time faculty dollars have been allocated and used in the program, and discuss their impact on the program/unit's FTE. Was the program/unit able to offer more sections and/or increase FTE? Were part-time faculty hired to meet student demand for courses?

Part-time dollars are available and utilized well. Money distribution is not an issue. As stated previously, the difficulty lies in finding degree-qualified part-time instructors. Part-time instructors will apply to both our college and to UNR, be offered positions at both institutions, and they will accept the position at UNR because UNR pays more than TMCC.

VIII. FUTURE DIRECTIONS

Five-Year Plan : Version by **Lambert, Theodore** on **12/07/2018 18:35**

Using your curriculum, enrollment, and student success strategies, and after evaluating your proposed resource needs, develop a 5-year plan for the program or unit. Please address the following quesitons.

What are the major goals that the department or unit hopes to accomplish in the next 5 years? Include an estimated timeline of goal completion.
Offering two new classes, MATH 295 and Math 330, so that the TMCC AS in Mathematics will transfer seamlessly towards a mathematics bachelors degree at UNR (completion asap). Better aligning curriculum and standards throughout all courses so that all students will acquire the skills necessary to succeed in the course and subsequent courses (ongoing objective). Offering each semester a schedule that best allows students to comply with the NSHE Gateway policy that requires degree seekers to finish a college level course within two semesters after enrolling at TMCC (ongoing objective). Development of course guides for both math 95 and math 96. These will better enable us to standardize both curriculum and standards given the number of part-time faculty teaching these courses.

How does the department or unit plan to improve degree/certificate completion and/or course completion if the department or unit does not offer any degrees/certificates?
MATH 295 and Math 330 will allow TMCC AS in Mathematics students a seamless 2+2 transition into a mathematics bachelors degree at UNR. Timely degree/certificate completion rests upon timely course completion: a current major and ongoing focus of the department is to offer each semester a schedule that best allows students to comply with the NSHE Gateway policy that requires degree seekers to finish a college level course within two semesters after enrolling at TMCC.

How does the department or unit plan align to the College's Strategic Master Plan (http://www.tmcc.edu/accreditation/strategic-master-plan/)? To which Core Themes and Objectives does the program or unit plan align?
The mission of the TMCC Mathematics Department--to provide students with the mathematical skills and conceptual understanding needed for success in college-level courses, to help students succeed in their chosen fields of study, to give students life-long problem solving and analytical thinking skills, and to increase the math literacy of the student population--closely reflects the College's mission to promote student success, academic excellence and access to lifelong learning.

Resource Requests : Version by **Farrenkopf, Paula** on **11/05/2018 20:53**

Faculty and/or Staff Positions
1. Request
2. Estimated time to hire or time the request will be made
3. Projected measurable outcomes: What does the program hope to introduce, develop, improve, accomplish, etc. as a result of the request?
4. Institutional Funding Priority: Indicate which of the following institutional funding priorities your request addresses:
   1. Compliance with mandates and requirements.
   2. Address and/or mitigate issues of liability.
   3. Address compensation equity.
   4. Improve efficiency and/or effectiveness.
   5. Leverage resources, investments with returns.
   6. Promote professional development.
5. Alignment to the College's Strategic Master Plan (http://www.tmcc.edu/accreditation/strategic-master-plan/)
   1. Core Theme(s)
   2. Objective(s)

Presently the Mathematics Department has no potential for growth because of the inablility to hire degree qualified part time instructors. This has been addressed in a previous section. We are barely meeting the needs with our present faculty. If we lose any full time instructors the need to replace will be needed to be done as quickly as possible. The lost faculty position would be needed to fill to meet the demands of our college level courses since presently we only have one part time instructor with the credentials to teach college level courses and he is retiring.

Capital Improvement (Facilities)
1. Request
2. Estimated time to hire or time the request will be made
3. Projected measurable outcomes: What does the program hope to introduce, develop, improve, accomplish, etc. as a result of the request?
4. Institutional Funding Priority: Indicate which of the following institutional funding priorities your request addresses:
   1. Compliance with mandates and requirements.
   2. Address and/or mitigate issues of liability.
   3. Address compensation equity.
   4. Improve efficiency and/or effectiveness.
   5. Leverage resources, investments with returns.
   6. Promote professional development.
5. Alignment to the College's Strategic Master Plan (http://www.tmcc.edu/accreditation/strategic-master-plan/)
   1. Core Theme(s)
   2. Objective(s)

No Value

Technology or Specialized Instructional Resources
1. Request
2. Estimated time to hire or time the request will be made
3. Projected measurable outcomes: What does the program hope to introduce, develop, improve, accomplish, etc. as a result of the request?
4. Institutional Funding Priority: Indicate which of the following institutional funding priorities your request addresses:
   1. Compliance with mandates and requirements.
   2. Address and/or mitigate issues of liability.
   3. Address compensation equity.
   4. Improve efficiency and/or effectiveness.
   5. Leverage resources, investments with returns.
   6. Promote professional development.
5. Alignment to the College's Strategic Master Plan (http://www.tmcc.edu/accreditation/strategic-master-plan/)
   1. Core Theme(s)
   2. Objective(s)

No Value

Professional Development
1. Request
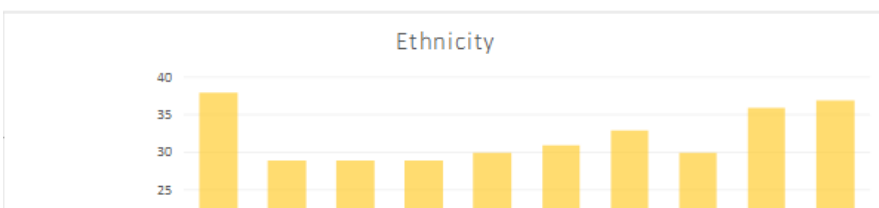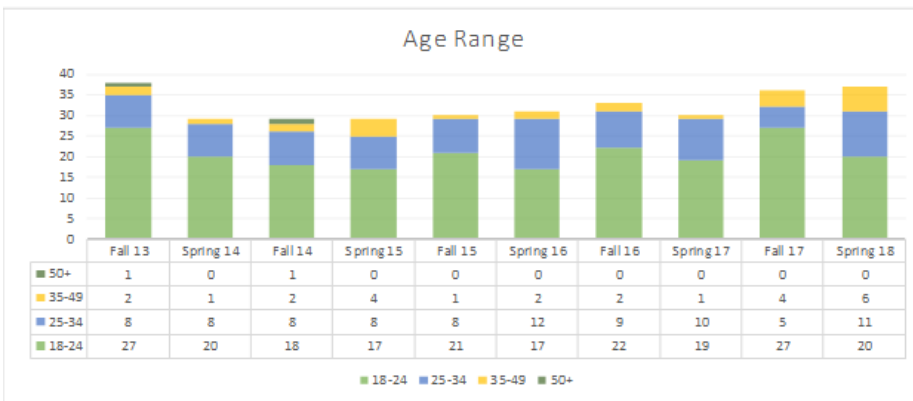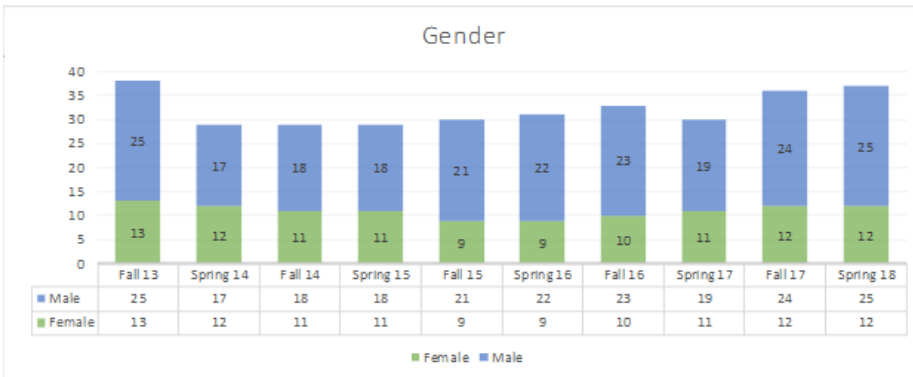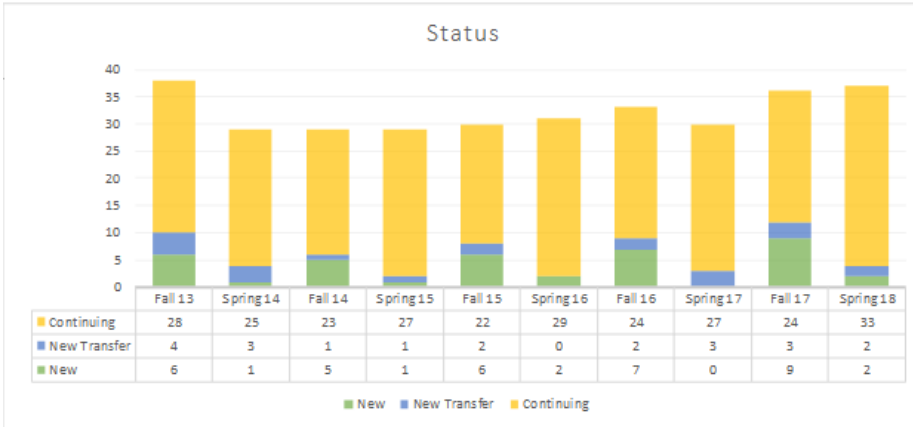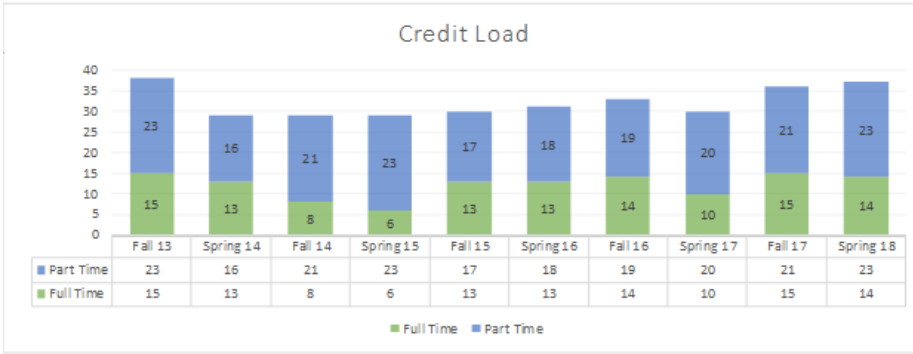2. Estimated time to hire or time the request will be made

3. Projected measurable outcomes: What does the program hope to introduce, develop, improve, accomplish, etc. as a result of the request?
4. Institutional Funding Priority: Indicate which of the following institutional funding priorities your request addresses:
    1. Compliance with mandates and requirements.
    2. Address and/or mitigate issues of liability.
    3. Address compensation equity.
    4. Improve efficiency and/or effectiveness.
    5. Leverage resources, investments with returns.
    6. Promote professional development.
5. Alignment to the College's Strategic Master Plan (http://www.tmcc.edu/accreditation/strategic-master-plan/)
    1. Core Theme(s)
    2. Objective(s)

Presently a curriculum manual is being developed for both the Math 95 and Math 96. This is to be used for new full time hires along with part time instructors. This will help align the curriculum and level these concepts need to be taught at. This will allow us to maintain the level of difficulty across all our course and enable us to collect data on common assessments. With this, funding for training days for Math 95 and Math 96 instructors is requested to help facilitate this.

APPENDICES

Appendix A: Detailed Enrollment and Demographics : Version by **Deadmond, Melissa** on **09/05/2018 19:52**

Appendix A
Demographics for Math Majors
(Fall 13 - Spring 18)

Credit Load

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
■ Part Time	23	16	21	23	17	18	19	20	21	23
■ Full Time	15	13	8	6	13	13	14	10	15	14

■ Full Time ■ Part Time

Status

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
■ Continuing	28	25	23	27	22	29	24	27	24	33
■ New Transfer	4	3	1	1	2	0	2	3	3	2
■ New	6	1	5	1	6	2	7	0	9	2

■ New ■ New Transfer ■ Continuing

Gender

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
■ Male	25	17	18	18	21	22	23	19	24	25
■ Female	13	12	11	11	9	9	10	11	12	12

■ Female ■ Male

Age Range

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
■ 50+	1	0	1	0	0	0	0	0	0	0
■ 35-49	2	1	2	4	1	2	2	1	4	6
■ 25-34	8	8	8	8	8	12	9	10	5	11
■ 18-24	27	20	18	17	21	17	22	19	27	20

■ 18-24 ■ 25-34 ■ 35-49 ■ 50+

Ethnicity

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
White	29	21	18	18	18	17	17	17	16	18
Unknown	0	0	1	0	1	1	1	1	0	0
Two or More Races	0	1	0	2	0	2	2	1	2	0
Hawaiian/Pacific Islndr	1	1	0	0	0	0	0	0	0	0
Hispanic	4	3	5	6	6	8	9	8	14	12
Black	1	0	1	1	1	1	0	1	1	1
Asian	2	3	4	2	4	2	2	1	2	5
Native Am.	0	0	0	0	0	0	1	0	1	1
International	1	0	0	0	0	0	1	1	0	0

■ International ■ Native Am. ■ Asian ■ Black ■ Hispanic ■ Hawaiian/Pacific Islndr ■ Two or More Races ■ Unknown ■ White

Additional Appendices

Academic Dean's Findings and Recommendations : Version by **Ellsworth, Julie** on **07/31/2019 22:59**

Academic Dean's Findings:

First, I would like to commend the Math Department for forging the way with using the new eLumens system for PUR reporting. I believe they have produced a valuable document and have done a good job analyzing and interpreting the available data. They were in essence a "guinea pig" for the new process and worked as a team to generate this informative reflection.

The challenges of the dual roles of the Math Department are apparent. They serve Math majors as well as all students needing math in all other majors, and these are very different and sometimes conflicting missions. I strongly advocate for keeping the Math major, even though there are a small number of students who pursue this pathway. The community college is the pathway for under-represented students, and this mission is reflected in TMCC Math majors who were 38.9% Hispanic, while TMCC overall was 28.8% Hispanic in the reporting period. I do not know the percentage of Hispanic Math majors at UNR, but their overall percentage of Hispanic students was reported as 19% in Fall 2017. TMCC is likely a substantial component of the minority student pipeline to Math majors at the university. This should be collaboratively tracked along with the pipeline to other math-intensive degrees, like Engineering. A high percentage of TMCC Math majors transfer (75%) and the majority of those went on to UNR (73% of those) in the reporting period. The department must show due diligence to the major, while also providing a huge service component to the college. This is a challenge. The department understands both sides of their mission, but more resources, professional development, and targeted faculty recruitment are required to fulfil this mission fully. Also, the PUR process needs to adapt to this reality and include different datasets for analysis for departments with very large service components, like Math and English.

An expanded analysis of the entry Gateway math courses (Math 120 and 126) will become imperative with the new NSHE co-requisite policy. Math 120 is not part of the math major at all (it is a large service course for non-STEM majors), and Math 126 is only included in the major for students starting with low math preparation. While they are not part of the Math major, together these two courses (Math 120 and 126), along with their pre-reqs (Math 95 and 96), account for the vast majority of students and FTE. Fill rates and unsuccessful enrollment attempts are informative when comparing courses, but the addition of respective FTE per course would help tell the full story. Many of the department's initiatives toward improving curriculum and pedagogy focus on these courses and they received little mention compared to the upper level math courses in the major because of the structure of the PUR.

The Math PUR data show that Math majors who start with Math 126 take longer to complete the major (2 semesters longer). This makes sense because they have more foundational knowledge to build before they can take the true math major's sequence starting with calculus. With the implementation of the co-req policy we will need to be sure to maintain the curriculum of Math 126 so that it continues to be a preparatory pathway to the math sequence required of STEM majors. I recommend partitioning out the analyses of course pass rates into "service courses" (below Math 127) and "majors' courses" (Math 127 and higher), and the success of Math 126 students based on whether or not Math 126 is their terminal math course or a pre-req in their major.

The NSHE co-requisite policy will dominate all discussions of TMCC math courses for the foreseeable future. The resources that will be needed to implement the policy will be significant and they were not included in this PUR due to timing. I believe the Math Department has strong leadership at this important juncture and faculty committed to continual assessment and improvement of curriculum and pedagogy. They are poised to rise to the challenges of improving student learning through the delivery of high quality co-req math courses and major's math courses as long as they are provided the necessary resources and infrastructure.

Strengths:

The Math Department has implemented numerous strategies to meet student need and improve student success.

Student need is very high. Math is neck-in-neck with English for being the largest department on campus in terms of student FTE. The Math Department is student-focused in scheduling, offers a wide range of course platforms including mini sessions, hybrid, and stretch courses, and maintains very high fill rates every semester.

Course pre-requisites have been thoughtfully realigned to maximize student progress (i.e., an A or B in Math 95 is a direct pathway to Math 120), courses have been developed to meet the needs of DRC students (i.e., Math 19/119), and new review and/or prep options have been developed to help students maximize their initial math placements (i.e., Drillz & $killz Workshop through WDCE). The Math Department works to meet the course needs at all campus sites (i.e., HSC, Edison, and Meadowood) and to fulfill Jump Start goals at off-site high school locations.

A thoughtful and thorough analysis was conducted in setting placement scores for the new Next-Gen Accuplacer test.

The Math Department has established curriculum "focus groups" per course to drive improvements in teaching and learning, eight Math faculty completed the inaugural ACUE training, and common final exams were developed for Math 95 and 96 to increase consistency across course sections and part-time faculty.

The faculty have demonstrated a generally cooperative mindset in addressing the co-req policy, and some are excited for the changes and energized by the possible benefits a new structure could provide for students. I feel this is well balanced by a departmental priority to maintain academic standards. Two faculty representing math attended a Co-Req Conference in Riverside, CA to learn how co-req implementation is done and how it is working in California. The connection to attend this conference as outside observers was made possible by NSHE.

Areas for Improvement:

The Math Department voted in new leadership in Spring 2019 in the structure of a Chair and Vice Chair. I believe this structure is an improvement because it allows the many duties of the Chair to be distributed across and/or shared by two people. Departments that are this large result in up to 21 credits of release for the year, which is 70% of a full-time faculty contract. This much release takes needed instructors out of the classroom in departments where it is difficult to find qualitied part-timers, such as in Math. More assistance, training, and streamlining of duties for Chairs is needed, especially for large departments.

Current initiatives are led by a core group of faculty, who are highly committed and work tirelessly on behalf of the college and students. In order to continue the progress being made and to meet the coming challenges to improve teaching, learning, and student success across the department, the collective faculty need to direct their efforts in a coordinated way and not get bogged down in side discussions or personal agendas. The focus should always be on finding, implementing, assessing, and expanding ways to increase student success while maintaining rigorous academic standards.

Finding qualified part-timers will become an even larger issue with the implementation of the NSHE co-requisite policy. The lack of qualified part-timers is not the department's failing, but a function of the job market for STEM trained people. Our part-time pay does not match UNR's part-time pay, and it is nowhere close to what a Master's qualified person in Math can make in the marketplace. We need to find new ways to attract and retain qualified part-time faculty.

Summary Action Recommended (Continue program, significantly revise, etc. followed by explanation):

I recommend maintaining the Math AS degree and exploring the possibility of adding an AS degree that combines math and secondary education in order to increase the pipeline of students going into math teaching to meet the needs of our local school district.

Course and pathway revisions will be forthcoming per the NSHE co-requisite policy. We will work within the department and the division, with our counterparts at other institutions, and within the framework of the NSHE co-req Task Force to do this in an effective and fiscally responsible way.

Departments with very large service components need different datasets to evaluate their effectiveness. Adding respective FTE per course in addition to reporting fill rate percentages would improve the PUR datasets. For Math I recommend partitioning out the analyses of course pass rates into "service courses" (below Math 127) and "majors' courses" (Math 127 and higher), and the success of Math 126 students based on whether or not Math 126 is their terminal math course or a pre-req in their major.

Service to other disciplines should not impact the pathway of students in the major. The curriculum of Math 126 must be maintained so that it continues to be a preparatory pathway to the math sequence required of STEM majors

Recommendations and Implementation Timeline:

Starting in Fall 2019 the current course "focus groups" for Math 120 and 126 need to be re-purposed to become the groups responsible for full implementation and tracking of the regular and co-req pathways for these courses.

With the phasing out of credit-based remedial courses I recommend redesigning the current Math Skills Coordinator position to become the Math Co-Req Coordinator. The tentative date for this transition would be Fall 2020.

Funds will be needed for professional development and targeted faculty recruitment to meet the needs of the co-req policy (detailed estimates are currently being developed). Raising the part-time pay to match UNR and/or hiring 2-year teaching post-docs to fill the current need for part-time instructors is needed immediately.

Once the co-req courses and pathways are established (by Fall 2021) a committee of math and education faculty should be assembled to conduct a needs assessment of and a draft program curriculum for a new AS degree in math and secondary education.

As time permits, more assistance, training, and streamlining of duties for Chairs is needed, especially for large departments. The need for an additional coordinator should be explored as the co-req framework is developed.

Resources Necessary for Implementation of Recommendations:

The above recommendations are based on re-directing current resources and finding additional funds to increase the part-time pay rate in Math to match UNR. UNR pays LOA $1,000 per credit, which is almost 18% higher than our rate of $850 per credit.

For Fall 2018 and Spring 2019 the part-time and overload payments to cover math courses cost $239,749.20. To increase that by 18% would require an additional $43,154 annually.

A full analysis has just begun to estimate the resources needed to implement the NSHE co-req policy. Resources will include more classroom space, more office space, more full-time and part-time faculty, adequate professional development, and enough administrative support to assess outcomes.

Impact of Recommendations on Division Planning:

The Division will need to carefully plan how to internally collect the key data in order to efficiently and effectively track the impact of the co-req policy.

Impact of Recommendations on Program/Unit Faculty:

More equitable participation in adopting new curriculum and pedagogy will be required of faculty across the department.

Academic Standards and Assessment Committee Findings and Recommendation : Version by **Deadmond, Melissa** on 07/03/2019 20:37

Academic Standards and Assessment Committee's Findings:
Program/Unit Reviewed: Math   **Year of Review: 2019**
Division: Sciences
Self-Study Committee Chair: Ted Owens
Date Reviewed by Academic Standards and Assessment Committee: 4/5/2019

Academic Standards and Assessment Committee's Findings:
The Math program at TMCC was in the first round of programs to complete the new revised PUR, and the first to do so using the eLumen software application. In addition, the Math PUR was among the first to be evaluated by the Academic Standards and Assessment Committee using an assessment rubric. The committee acknowledges that both the PUR and the rubric

can still be improved. The ASA Committee aims to move TMCC away from assessing courses in isolation and toward program learning outcomes assessment. Furthermore, the committee acknowledges that "programs" can be defined as degrees and certificates as well as general education courses if departments serve more students in general education than in their majors. The committee plans to make this distinction clearer in further revisions of the PUR template.

The Academic Standards and Assessment Committee found that the Math department/program has clear Program and Course Student Learning Outcomes, solid assessment protocols and strong FTE growth. In addition, the department provides clear evidence of assessment-driven improvement, as well as student-centered scheduling to accommodate the program's strong enrollment. The committee agrees that the program may see a significant impact from planned co-requisite course requirements to potentially be mandated by the NSHE Board of Regents. Further, the committee recommends considering program curriculum and the continuation of the AS Mathematics degree, and studying the implications for courses such as Math 295 and Math 330. Additional concerns were raised regarding resource requests not directly tied to assessment results and the Strategic Master Plan, as well as the statement regarding student success. Finally, the committee recommends: that the department develop a set of "service/general education" Program Student Learning Outcomes; to develop Math 295 and Math 330 by continuing to offer an AS in Mathematics; research a possible collaboration with the Education department to create a dual AS Mathematics/As Secondary Education degree; and update the program assessment cycle.

Program Strengths:

Program Strengths
The program has well-defined Program Student Learning Outcomes and Course Student Learning Outcomes, good assessment protocols, and strong FTE growth.

There is concrete evidence of assessment-driven improvement plans.

The program's enrollment is robust, and the department schedules classes to accommodate student demand.

Areas of Concern or Improvement:

Areas of Concern or Improvement:
The potential Board-of-Regents-mandated co-requisite plan may have a significant impact on the program.

The department noted that it may discuss deactivating the AS Mathematics and refocusing itself as a service program, but it has recently brought on Math 295 and Math 330. From a transfer agreement standpoint, these courses should be part of the degree.

Evidence of assessment and/or ties to the Strategic Master Plan is not presented for several courses nor for resource requests.

A clearer and more specific statement of the strategies for student success is needed.

Recommendations:

Recommendations:
Given the department's significant service function to general education, it is recommended that the department develop a set of "service/general education" Program Student Learning Outcomes that could be assessed in the appropriate developmental-gateway course pathways, for example Math 96-Math 126, or Math 95-Math 120.

In order to develop Math 295 and Math 330, the department should continue to offer the AS in Mathematics.

If the department decides to continue offering the AS in Mathematics, it should consider collaborating with Education faculty to develop a dual AS Mathematics/AS Secondary Education. There is room for electives in the AS Mathematics degree.

Update the assessment cycle so there is regular Course and General Education Assessment.

Other comments:

Other Comments:
There appears to be some confusion in the Course Assessment Cycle section. The section author noted where the eLumen table did not include when a course was to be assessed, but did not understand that they were supposed to indicate when the department planned to assess these courses. It is the understanding of the committee that Skills Center (SKC) courses are not part of the Math department and instead belong solely to the Skills Center.

There was a mention of previous PURs outlining the need for more robust academic support services to support increasing enrollment and student success, but this didn't seem to be addressed clearly in this PUR.

Vice President of Academic Affairs' Findings and Recommendations : Version by **Clifford, Donna** on **08/14/2019 21:09**

VPAA's Findings:
Math is a robust program with growing FTE. The faculty and staff have been very proactive in working to achieve the access requirements for the NSHE mandated Gateway initiative. I am pleased to see the high representation of Hispanic students as Math majors. I am impressed with the incredible amount of work that has been put into all aspects of improving access and outcomes for students. The deep dive into placement score, the development of Drillz and $killz Workshops, the student-focused scheduling that includes mini sessions, stretch, etc., all are innovative approaches to helping our students succeed. Unfortunately, with the co-req NSHE mandate, we will not be able to see the true impact of these endeavors. It must be noted that the Math department will be greatly impacted by the co-req policy and we will not know the true cost or impact for some time.

Strengths:
Math has taken the initiative in continuous improvement with the use of curriculum focus group and towards decreasing variability by implementing common final exams for Math 95 & 96. I am also delighted that eight (8) faculty members successfully completed the ACUE course.

It is apparent that Math takes Assessment very seriously and sees it as a vehicle for improved student learning. They have assessment driven improvement plans, well-defined PSLO and CSLO, and strong assessment protocols.

The co-chair structure works well for departments as large as Math. It also allows personal strengths to be used to their fullest.

Areas for Improvement:

Much of what one can say in this area may be moot due to the NSHE co-req policy mandate. I agree with the Dean's statement that more of the department should get involved and assist the core group of movers and shakers in driving the change that is needed for improving teaching and student success.   I believe the AS degree should be retained as, according to the data, it is a vehicle for our Hispanic student population to enter the lucrative STEM fields.

The attracting and retaining of part-time faculty has been and will continue to be a challenge unless a pay differential is established.

The following recommendations made by the Academic Standards and Assessment Committee and Dean are upheld, and/or additional recommendations include the following: (Please include an implementation timeline.)
The Dean's recommendations 1 (ASAC #3), 2, 3 – if funding is available, 4, and 5.

The ASAC's recommendations 1 – but time it with the co-req implementation, 2, 3 (Dean's #1), and 4.

The following recommendations made by the Academic Standards and Assessment Committee and Dean are not upheld: (Please provide an explanation.)
N/A
In order to implement recommendations towards program improvement, the following resource requests are upheld, and/or additional recommended resources include the following:
No Value
The following resource requests are not upheld: (Please provide an explanation.)
No Value
Summary Action Recommended (Continue program, significantly revise, or discontinue, followed by explanation):
No Value