ACADEMIC PROGRAM REVIEW REPORT

MATHEMATICS & PRE-ENGINEERING

MATH.AS & PENG.AS

Spring 2023

Signature Page and Archiving

_____

Vice President of Instruction Date

_____

President Date

Archiving:

Division Chair submits to Dean and then Vice President for Instructional Services.

1. A complete electronic version of the Academic Comprehensive Program Review
2. All documentation (electronic)
3. A signed signature pages

Program Review
Faculty and Dean Verification

By signing I verify I have been an active participant in the program review process and have read this Program Review Report to be submitted to the Program/Department Review Committee:

_____ Date_____
Program Lead – Nicole M. Dick

_____ Date_____
Benjamin Gershon

_____ Date_____
Thuy "An" Nguyen

_____ Date_____
Perla Salazar

_____ Date_____
Jonathan Whitacre

I verify that this program review report is ready to be reviewed for feedback and action by the Program/Department Review Committee.

_____ Date_____
Division Leader – Nicole M. Dick

As dean of the Academic or Technical Education and Workforce Development Division, I verify that this program review report is ready to be reviewed for feedback and action by the appropriate Program/Department Review Committee. If revisions to original submission of the report are requested (by the committee), I understand another signature by me will be required:

_____ Date_____
Dean – Philip Terpstra

Adapted from Azusa Pacific University, Arizona State University, & Tyler Junior College, 2017.

OBJ

OBJ

Table of Contents

[Note: programs utilizing external accreditation documents must still complete this table of contents and should cut and paste material into report.]

Program Review Components

Other Attachments (to be completed and sent under separate cover)
..... Program Review Committee Report and Rubric
..... Administrative Response

Adapted from Azusa Pacific University, Arizona State University, & Tyler Junior College, 2017.

Component A - Mission and Context

A.1 Program Mission and Purpose State your program's mission and purpose and how it helps to fulfill the broader mission of GCCC. Briefly describe where your program fits within the college's structure (e.g. division/dept.) and what credentials and/or areas of specialization it grants. Briefly, discuss the trends in higher education related to the need for your program and identify how the program is responsive to the needs of the region or broader society it intends to serve.

The Mathematics Department is committed to offering quality learning opportunities to students. The courses are designed to meet the preparatory needs of all majors, from foundational to advanced mathematics. The department strives to provide the student with the opportunity to develop mathematical reasoning and numeracy. Students can improve their ability to analyze information and make informed decisions based upon that data.

A.2 Progress Since Last Review Before commencing with this review, attach the Program Goals with Recommended Action Steps (or equivalent) (Template Appendix A), as well as the Administrative Response to those goals (Template Appendix B), and your Planning Documents (Appendix D) from your last review. Identify the original goals from your report as well as any new goals that emerged from your annual reports and in the planning process and provide evidence your progress toward accomplishing them. (If you don't have a copy, ask your Dean).

See attachment for previous program review goals. Goals that were met or had progress made on them are described below.

Lower class size in development al classes – achieved.
MATH 005 has a class capacity of 18 students.

Math department will provide a software (WebAssign/ Canvas) workshop for math students prior to the start of Fall 18 – indirectly this is achieved by the Cengage provided assignments for WebAssign and GCCC template provided assignments for Canvas

NOTE: The information for Data Tables required in Components B-E will be provided to the fullest extent possible by the Office of Institutional Effectiveness, Planning, and Research (IEPR). Data collection for faculty will be as of November 1 and student enrollment will be as of October 15 for students of the year prior to the submission of the report (follows IPEDS delineation). Programs ***may*** choose to update data beyond November 1 or October 15 of the year prior to the submission of the report. Data collection for student completion, GPA, and class size will end by June 30 of the year prior to the submission of the report. Programs may need to supplement the tables with information unavailable to IEPR. In such cases, programs ***must*** specify collection methods and dates (or date ranges). For example, faculty data are recorded at the department level and may not accurately reflect the program assignment. The program is encouraged to review faculty data and make adjustments according to program records. Please provide IEPR with any updated faculty data tables.

Data queries can be found in Earth Reports under Accreditation in the Program Review folder.

Component B - Faculty Characteristics and Qualifications

The following faculty classification definitions apply to the data exhibits in section B.

- Full-time faculty – faculty whose load is 100% of a full-time contract within the program/department
- Part-time faculty – faculty whose load is less than 100% of a full-time contract within the program/department

B.1 Faculty Qualifications: Faculty listed below are those who taught courses for the program within immediate previous academic year as well as those on the current academic year's faculty roster from the Dean's office as of November 1st. (Insert rows as needed).

Faculty Qualifications			
Name of Faculty Member	Highest Degree Earned and Date of Acquisition (provided by dept.)	Institution of highest degree (provided by dept.)	Certifications, practices, specialties, etc. related to the discipline that illustrate qualifications
Full Time			
Boateng, Michael	Masters of Science in Applied Mathematics (May 2014)	Youngstown State University	Emphasis in Applied Mathematics and Differential Equations
Bedard, Antoine	Ph.D. Mechanical Engineering	West Virginia University	
Carlson, Ronald	MS Physics (May 1984)	University of Missouri at Kansas City	18 graduate credit hours in Computer Science
Dick, Nicole	Masters of Science in Statistics (May 2008)	Kansas State University	
Gershon, Benjamin	Master of Arts in Mathematics (May 2019)	University of Kansas	
Kocher, Amy	BS in Secondary Mathematics Education (May 2004)	North Carolina State University	North Carolina State Teaching License

Nguyen, Thuy	Masters of Science in Mathematics (December 2015)	Wichita State University	Emphasis in Applied Mathematics
Nairat, Mazen	PhD in Physics (2012)	New Mexico State University	
Salazar, Perla	Masters of Science in Education (May 2017)	Fort Hays State University	Professional Teaching License from KBE, 26 hours of Graduate Level Mathematics courses
Whitacre, Jonathan	MS Mathematics (Dec 2010)	Youngstown State University	Secondary Education Track
Part Time			
Atchley, Beth	M.A.E. Education (2008)	Baker University	18 Hours in Mathematics
Baier, Michelle	M.S. Mathematics (1997)	Pittsburg State University	
Barrett, Jennifer	M.L.S. Liberal Studies (2010)	Fort Hays State University	
Bosworth, David	Unknown		
Breitkreutz, Betsy	Bachelor of Science in Education	Emporia State University	
Devgan, Rajneesh	M.S. Mathematics	Newman University	
Dowell, Luke	Unknown		
Dunn, Christopher	M.S. Physics	University of Texas San Antonio	
Getahun, Yonas	M.S. Mathematics (2005) M.S. Computer Science (2014)	Addis Ababa University, Ethiopia Troy University, Troy Alabama	
Goymerac, Addie	Unknown		
Hays, David	M.E. Education (2014)	SW College	18 hours in mathematics
Hook, Darrin	Unknown		
Hefty, Steven	MSE School of Ed. (1980)	University of Kansas, Education	Post master's work in mathematics & chemistry: 6 hours mathematics & 18 hours science
Jackson, Sarah	Unknown		
Kalarikkal, Biju	M.S. Applied Mathematics April 2000)	M S University, Vadodara, India	Professional Teaching License (Math, 7-12) ESOL Certification (PREK-12)
Manly, Catelyn	Unknown		
Merrihew, Bonnie	M.S. Applied Mathematics (2009)	Fort Hays State University	

Marcy, Charles	MBA Finance (1982)	Xavier University	
Neri, Elise	B.S.E. Mathematics (2008)	Central Michigan University	
Platt, Joshua	BS Mathematics (2012)	Fort Hays State University	
Sullivan, Angela	Unknown		
Thomeczek, Elizabeth	Masters in Education Masters in School Counseling	Pittsburg State University Southeastern Oklahoma University	Licensed Professional Secondary Educator with endorsements for English as a Second Language - *KS only* Licensed School Counselor - *OK only (in process of transferring licensure to KS)* Certified Law Enforcement Officer - *KS only*
Terpstra, Philip	M.S. Health Physical Education, & Recreation (1996)	Fort Hays State University	
Weaver, Samuel	Juris Doctorate	Washington and Lee University, School of Law	
Wenzel, Leslie	M.S.S. Sports Management (2005)	US Sports Academy	

B.2 Faculty Demographics

Faculty Demographics						
	Full-time		Part-time		Total	
	Female	Male	Female	Male	Female	Male
a.)Faculty who are						
Non-resident (International)						
Asian	1			2	1	2
Black, non-Hispanic		1		1		2
Hispanic	1		1		2	0
American Indian or Alaska Native						
Native Hawaiian / Pacific Islander						
Two or more races						
Race/Ethnicity Unknown (Or Decline to Identify)			1	3	1	3
White, non-Hispanic	2	4	10	8	12	12
Totals	4	5	12	14	16	19
c.) Number of faculty with doctorate or other terminal degree		1				1
d.) Number of faculty whose highest degree is a master's, but not a terminal master's	3	4	7	7	10	11
e.) Number of faculty whose highest degree is a bachelor's	1	0	2	1	3	1

B.3 Faculty Scholarship/Service: Provide, in tabular or report format, a comprehensive record of faculty scholarship/service for the last 5 years. In addition to traditional scholarship, include faculty accomplishments that have enhanced the mission and quality of your program (e.g., discipline-related service, awards and recognitions, honors, significant leadership in the discipline, etc.).

Name of Faculty Member	Scholarship and Service
Dick, Nicole	Division Chair (2016-current), Faculty Senate Member (2016-2021) and President (2019-20) , SLAT Member (2017-2019), NISOD Excellence Award Recipient (2020), Employee of Year (2020), Faculty Member of the Year (2020), Curriculum and Instruction Committee (2019-current), GC3 Educators (2020-current), Innovation Grant Recipient (Fa21), Minigrant Recipient (Fa21)

Gershon, Benjamin	Tutored Mathematics in the Comprehensive Learning Center (Sp22), Developed the Online Precalculus Class (Sp23)
Kocher, Amy	Minigrant Recipient (Fa20)
Nguyen, Thuy	Mentor for new instructor (Fa16, Fa18, Fa20), Cengage Renewal Committee Sp20
Salazar, Perla	Mentor for new instructor (Fa21), Faculty Senate Member (2016 – 2022) and President (2020-21), SLAT Member (2019-current), NISOD Excellence Award Recipient (2021), Employee of the Year (2021), Minigrant Recipient (Fa17)
Whitacre, Jonathan	Member of Dev Ed Committee (2019-current)

B.4 Omitted

B.5 Analysis of Faculty Qualifications: From the evidence available, evaluate the qualifications and contributions of your faculty toward fulfilling the mission of the program. Comment on the composition of your faculty in terms of diversity. Identify gaps in preparation, expertise, or scholarly production that need to be filled.

Historically, our department has been diverse. As table B.2 shows, we have a mix of demographics. It can also be seen (in table B.1) that our faculty have a diverse background. There are some faculty with public-school experience and some with industry-experience. We have teachers from across the country as well as varying ages.

At this time, our department does not see any gaps.

B.6 Full-Time Faculty Workload: For each of the past 5 years, report full-time faculty workload distribution based on the categories identified below. Include units assigned as overload. (get from your Dean's office).

Name of Full-Time Faculty	Semester Credit Hours										
Academic Year [Please fill in academic years, i.e. 15-16.]	F17	SP18	F18	SP19	F19	SP20	F20	SP21	F21	SP22	Avg.
Bedard, Antoine					17.3	17.3					17.3
Boateng, Michael	15	19	20	14							17
Carlson, Ronald	8.7	5.7	11.3	12.3	3		3				7.3
Dick, Nicole	16	14	17	16	14	16	20	17	17	19	16.6
Gershon, Benjamin									15	18	16.5
Kocher, Amy					15	18	15	15			15.8
Nairat, Mazen									8.7	6	7.3
Nguyen, Thuy	21	18	18	18	20	14	18	18	17	22	18.4
Salazar, Perla	18	18	18	21	15	16	19	17	15	24	18.1
Whitacre, Jonathan	15	15	18	18	21	15	21	18	21	18	18.0
Total	93.7	89.7	102.3	98.3	105.3	95.3	96	85	93.7	107	

Faculty Workload (over past 5 years, ending Academic Year 2016-17)										
Name of Full-Time Faculty						Administrative and other types of assignments in dept. (e.g., Division Leader, program review, other dept. tasks)				
Academic Year [Please fill in academic years, i.e. 15-16.]	F17	SP18	F18	SP19	F19	SP20	F20	SP21	F21	SP22
Bedard, Antoine										
Boateng, Michael			1							
Carlson, Ronald				1		1		1	1	3
Dick, Nicole		1		1	3	3				.75
Gershon, Benjamin										3
Kocher, Amy										
Nairat, Mazen									1	4.5
Nguyen, Thuy					1					1
Salazar, Perla	2				1	1				
Whitacre, Jonathan										
Total	2	1	1	2	5	5	0	1	2	12.25

B.6.1 Analysis of Faculty Workload: In what ways does faculty workload contribute to or detract from faculty ability to work effectively in the program?

Full time instructors have an average load of over 15 hours per semester, for the math department.

Physics instructors tend to have a lower load than required (Bedard taught 2 math classes in addition to physics).

Aside from Spring 2022, administrative assignments have been pretty low, around 1 hour per full-time faculty member. Data were reported/gathered in two different fashions, from F17 through SP20 data were from an Autobots report showing ADMI as part of faculty load. From F21 through SP22 data were collected from Dean of Academics office through overload sheets. It's hard to say if the values are comparable due to differences in reporting. Assuming they are comparable, then it looks like Spring 22 was special.

The three hours for Ron Carlson were assigned in addition to his teaching load in CSCI as he was building a new program for our Title III Grant. He did not teach and MATH or PENG classes that semester.

The 4.5 hours for Mazen Nairat reflect low enrollment in Physics and PENG programs. Administrative assignment was given with the goal of increasing enrollment and recruiting for those programs.

B.7 Percentage of courses taught by full-time and part-time status: The following table includes the percentage of credit bearing courses taught by program faculty (by classification) during the five most recent years for which data are available.

Percentage of Courses Taught by Faculty					
Faculty Classification as of November 1	2017-18	18-19	19-20	20-21	21-22
Full-Time	46.21%	52.54%	51.35%	54.70%	55.93%
Part-time	53.79%	47.46%	48.65%	45.30%	44.07%
TOTAL	100%	100%	100%	100%	100%

B.8 Student Faculty Ratio: The following table includes student to faculty ratios for the 5 most recent years. The ratios provided are based on the number of students enrolled in the program and the faculty assigned to teach in the program. Programs that offer courses in which students from outside the program often enroll (e.g., general studies courses), may wish to include additional data such as the average number of students per course taught by program faculty.

Student: Faculty Ratio					
Academic Year	2017-18	18-19	19-20	20-21	21-22
# of Full-Time Faculty	6 (5 Math, 1 Physics)	6 (5 Math, 1 Physics)	6 (5 Math, 1 Physics)	5 (5 Math, 0 Physics)	6 (5 Math, 1 Physics)
# of Part-time	17	11	13	12	12

FTE Faculty	11.7	9.7	10.3	9	10
~~# of Full-Time Students~~					
~~# of Part-Time Students~~					
~~FTE Student~~					
~~FTE Student: FTE Faculty Ratio*~~					

*Full-time equivalent (FTE) is calculated using the following formula:
Total # Full-Time Faculty (or Students) + One-third Total # Part-Time Faculty (or Students)

B.8.1 Analysis of Faculty Distribution: Comment on the adequacy or number of full-time vs. part-time faculty and the ability to deliver quality education.

The percentage of courses taught by full-time faculty has gradually increased over the past 5 years. The most recent year is the highest percentage for full-time faculty and the lowest percentage for part-time faculty.

Our number of full-time faculty members has remained constant over the past 5 years for math. Our part-time count in 2017-18 was the highest, since then it has dropped by about 25% and remained constant at that value. This likely contributes to the lower percentage of courses taught by part-time faculty mentioned above.

In conclusion, due to the consistent values over the last 5 years, the number of full-time and part-time faculty members seems adequate.

B.9 Summary of Teaching Effectiveness: The following figure includes data derived from student end of course evaluations for the program.
Summary provided below table.

nstructor	Respondents	Enrollments	Response Rate	Average
Michelle Lynn Baier	1	31	3.23	4.83
Ronald Carlson	1	18	5.56	4.42
Antoine Bedard	3	47	6.38	4.46
Biju Kalarikkal	5	66	7.58	4.97
Charles Marcy	12	117	10.26	4.19
Beth Atchley	17	130	13.08	4.72
Elizabeth Thomeczek	8	55	14.55	4.17
Devgan Rajneesh	6	33	18.18	4.65
Philip Terpstra	47	243	19.34	4.31
Elise Neri	58	289	20.07	4.49
Yonas Getahun	49	190	25.79	4.42
David Hays	128	493	25.96	4.15
Philip Terpstra	31	109	28.44	4.48

Jonathan Whitacre	241	787	30.62	4.18
Leslie Wenzel	166	522	31.8	4.36
Nicole Dick	141	435	32.41	4.62
Thuy Nguyen	217	658	32.98	4.37
Bonnie Merrihew	4	12	33.33	4.38
Amy Kocher	133	312	42.63	4.12
Michael Boateng	75	174	43.1	4.26
Benjamin Gershon	70	157	44.59	4.4
Perla Salazar	390	768	50.78	4.44
Rajneesh Devgan	24	42	57.14	4.21
Steven Hefty	14	18	77.78	4.34

Statistics

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	24	0	4.4142	0.0445	0.2182	4.1200	4.2225	4.3900	4.4875	4.9700

B.10 Other Evidence of Faculty Effectiveness: Programs may provide additional evidence (not anecdote) of faculty effectiveness.

None at this point.

B.11 Analysis of Teaching Effectiveness: Using data from the information above, as well as other pieces of available evidence, evaluate the effectiveness of faculty in the classroom. When applicable, include an analysis of faculty effectiveness across delivery system (e.g., outreach locations, online, etc.).

On a 5-point scale, with 5 being the highest, the common trend amongst all faculty and all delivery systems was a few 1, 2 and 3s, but mostly 4 and 5s.

B.12 Faculty Summary Analysis: Based on evidence and responses provided above, provide a summary analysis of the quality and quantity of faculty associated with the program. Discuss how workload, course distribution, or other considerations impact the ability of the program to deliver excellent teaching to students. Identify resources, mentoring programs, or other services provided or made available by the department to ensure that faculty are developed professionally (this may include release time or funds provided to faculty for curricular and professional development). What changes, if any, should be implemented to ensure faculty effectiveness? Identify any needs related to faculty that impact delivery of a high-quality program.

As mentioned in B.11, the faculty has high quality. There are also a large number of faculty servicing our students. Since we service a wide area, there are many of our faculty with a very small workload. Most are adjunct or outreach in their local area. The full-time on-campus faculty serve as mentors and liaisons to all off-campus faculty. This helps assure that the same material is presented everywhere the course is offered. This also allows for communication in regards to any resources needed by the off-campus faculty that we could help provide. At this time, there is no evidence of a need or change for high-quality education.

Component C - Quality of Curriculum and Student Learning

C.1 Curriculum Structure: Provide a brief overview of the course offerings and degree requirements of your program. To what degree does the program curriculum align with other comparable programs at other institutions and exemplify best practices for the discipline? Describe the process used by faculty to ensure the program is current and competitive.

GCCC offers 14 math classes, ranging from developmental to calculus based. Students with an emphasis in mathematics are requested to take the following courses at GCCC:

Semester 1		**15-17 hours**
Course No.	**Course Title**	**Credit**
*ENGL-101	English I	3
*MATH-122	Calculus & Analytic Geometry I	5
*	Lab Science Requirement	4-5
*	Student Success Requirement	1
*	Personal Wellness Requirement	2-3

Semester 2		**16 hours**
Course No.	**Course Title**	**Credit**
*ENGL-102	English II	3
**MATH-123	Calculus & Analytic Geometry II	5
***	Program Elective Course (select from list below)	5
*PSYC-101/SOCI-102	General Psychology or Introduction to Sociology	3

Semester 3		**14-16 hours**
Course No.	**Course Title**	**Credit**
*COMM-101	Public Speaking	3
**MATH-205	Calculus & Analytic Geometry III	5
***	Program Elective Course (select from list below)	3-5
*	Humanities & Fine Arts Requirement	3

Semester 4		**12-14 hours**
Course No.	**Course Title**	**Credit**
***	Program Elective Course (select from list below)	3-5
	Open Elective Course	3
*	Social Science Requirement	3
*	Humanities & Fine Arts Requirement	3

Those with an emphasis in pre-engineering:

Semester 1		**16-17 hours**
Course No.	**Course Title**	**Credit**
*ENGL-101	English I	3
*MATH-122	Calculus and Analytic Geometry I	5
*CHEM-109	College Chemistry I	5
*	Student Success Requirement	1
*	Personal Wellness Requirement	2

Semester 2		**14-16 hours**
Course No.	**Course Title**	**Credit**
*ENGL-102	English II	3
**MATH-123	Calculus and Analytic Geometry II	5
***	Program Elective Course (select from list below)	3-5
*PSYC-101/SOCI-102	General Psychology or Introduction to Sociology	3

Semester 3		**16 hours**
Course No.	**Course Title**	**Credit**
*COMM-101	Public Speaking	3
**MATH-205	Calculus and Analytic Geometry III	5
**PHYS-207	Engineering Physics I	5
*	Humanities & Fine Arts Requirement	3

Semester 4		**14 hours**
Course No.	**Course Title**	**Credit**
**PHYS-208	Engineering Physics II	5
	Open Elective Course	3
*	Social Science Requirement	3
*	Humanities & Fine Arts Requirement	3

This is very similar to the first two years of a Mathematics major at a four-year institution. Thanks to Kansas Board of Regents outcomes, almost all mathematics courses offered at GCCC transfer within Kansas. Developmental classes usually transfer as electives.

Each semester, faculty complete a course assessment and use that information to assess student learning. A selection of student learning outcomes (SLOs) for the course are looked at each semester, to identify problems and success. This helps instructors to identify where in their courses they may need to make adjustments. It also provides instructors of the same course to share methods and discuss issues for each course. Over the span of five years, our goal is to assess all SLOs for each course.

Examples of adjustments made include: Departmental changes to final exams to make sure questions map to an SLO and assess one thing, requiring at least one project in Fundamentals of Statistics, impacted

design and adoption of Department Standard and Philosophy, MATH 005 redesign to include more hands-on activities (shared resources in Canvas and Teams for all instructors)

C.2 Assessment of Student Learning: Attach your program's most updated overall Annual Assessment Plans (Appendix C) and Annual Assessment Reports since your last program review (Appendix D). Briefly describe the direct and indirect measures your program uses to assess student learning. Analyze how well students are demonstrating each learning outcome within the program. If there is a culminating project in the program, include an objective evaluation of a sample of these products since undertaking the last program review. Use a rubric or other criteria to support your assessment of the culminating projects, and analyze the results of this evaluation. Specify the areas where students are not meeting expected levels of competency and provide an analysis of possible explanations for these results.

See appendix/attachment for file with last five years of Program Assessment Reports (Program Assessment Math PreEng for 2023 Program Review.xlsx).

Indirect measures have not been taken of the program performance. This is a department goal that we have set. See appropriate section of this document for comment (goals at end).

The direct measure we use is usually final exams from the upper-level math classes: Calculus II, Calculus III, and Differential Equations. Due to low enrollment in those classes, we do not have a lot of data to look for trends. From what we can see, typically about 0 to 5 students (often 2 or 3) are being assessed. Rates of meeting the targets are very varied (0% for one PLO in SP19 to 100% for PLOs met in multiple semesters). On average, over the last 10 semesters, we've had a target hit to not hit ratio of 7:10. This is not great. But if we consider 2 of 3 students as successfully met target, then our ratio of hit to missed changes to 12:4. I feel this is a better indicator of our programs success.

C.3 Curriculum Map of Program Student Learning Outcomes:
Paste your program's curriculum map below or attach as an appendix

Attached as Appendix. See file: Math_cmap_F22.pdf (also available through course catalog: https://www.gcccks.edu/academics/academic_catalogs/catalog22-24_03-02-23.pdf see page 91).

C.4 Assessment of Curricular Effectiveness: Using your program's curriculum map and the evidence collected from the assessment of student learning, outline your program's intended steps for improving student learning. Include any proposed changes to the curriculum that may be necessary.

The department has made sure the curriculum map is up to date and being used to inform our decisions. All program outcomes are addressed within our program courses. The department's intended steps to improve student learning, based on the assessment of student learning, are to continually provide adequate exposure to each learning objective and implement continuous review of covered topics to increase knowledge retention. We do this through end-of-semester Course Assessments, end-of-year Program Assessments, and 5-year Program Reviews (this document).

For example, one of our PLOs in the MATH program is "Construct single and multivariable mathematical models for real world problems involving continuous change". Students visit this in Calculus 1 when learning about related rates (we reduce a multi-variable problem to a single variable problem through assumptions and conditions). That topic is revisited again in Calculus 3 after students have learned to solve the same type of problem, but with less assumptions and conditions (leaving it as a multi-variable problem).

There are no proposed changes to the current curriculum. The department has started piloting a companion model for college algebra to help students progress through the developmental levels at a faster pace. The department plans on continuing work on the companion models for all developmental courses.

C.5 Assessment of Diversity in the Curriculum: Describe and evaluate your program's efforts to create a culture of diversity through the curriculum. In what ways is your program being intentional about embedding diversity-related issues in the curriculum? Diversity may include, but is not limited to, differences in religion, race, ethnic origin, nationality, socioeconomic status, sexual orientation, gender identity and expression, disability and political ideology.

The department has hired instructors from various backgrounds with different cultures. The department has included names from various cultures in word problems. During class instructors call on students with different cultures to encourage them to not only participate but so that other students can be familiar with their accent and culture. Instructors will also place students into groups to ensure that there is a variety of cultures in each group.

C.6 Use of Continuous Assessment for Educational Effectiveness: Describe and evaluate the process that your program uses to annually evaluate the quality of curriculum and to assess student learning. Document how your program has used its assessment findings to impact area decisions. In what ways is this process effective toward making effective educational decisions? In what ways should the process change?

Each teaching faculty is responsible for completing an Individual Course Assessment at the end of every semester for each course he/she teaches. If multiple sections of the same course are taught a Collaborative Course Assessment is filled out. All faculty that teaches that common course will then discuss their shared findings from the Collaborative Course Assessment. Relevant summaries are shared with the whole department. The department has decided that twenty five percent of the Student Learner Outcomes (SLOs) are evaluated for each academic year, and thus, it takes four academic years to assess all the SLOs. However, if an SLO is not met it continues to be assessed in the following cycle. The department has decided that shared courses will have common assessment artifacts. We have decided that common courses will use, in their Course Assessments, the results from the Final Exam to evaluate and to determine whether the SLOs, set by the department or KBOR, are being met by the students. If students are not meeting the target for an SLO, then a plan or a strategy will take place in the future to address that specific SLO. The department uses these data to help with decision making. For example, based on conversations about collaborative course assessments the department has implemented different teaching strategies and techniques. The department also completes an Annual Program Assessment to assess how our students are performing in the Program Learning Outcomes (PLOs). All SLOs from each program course are mapped to the PLOs by the department in our curriculum map. Each PLO is assessed by two direct measures, that come from the Final Exams of

two higher level courses, and one indirect measure. The department is working on getting data for our indirect measure. This has been the hardest data to collect thus far.

Component D: Student Enrollment and Success

D.1 Student Enrollment: The following table includes fall enrollment data disaggregated by gender and ethnicity for the five most recent years. The ethnicity categories are based on IPEDS requirements. Therefore, International (non-resident alien) students will only be reported in this category regardless of their ethnicity.

As of Fall Census	2017-18		2018-19		2019-20		2020-21		2021-22		Totals
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Non-resident (International)	0	3	0	1	0	3	1	3	1	4	16
Asian	0	2	0	1	0	2	0	1	0	2	8
Black, non-Hispanic	0	5	0	0	0	0	0	2	0	0	7
Hispanic	2	23	2	16	3	14	4	12	2	10	88
American Indian or Alaska Native	0	1	0	0	0	0	0	0	0	0	1
Native Hawaiian / Other Pacific Islander	0	0	0	0	0	0	0	0	0	0	0
Two or more races	0	0	0	0	0	0	0	0	0	0	0
Race/ethnicity Unknown	0	0	0	0	0	0	0	0	0	1	1
White, non-Hispanic	0	8	4	9	2	5	2	3	1	2	36
Totals	2	42	6	27	5	24	7	21	4	19	

D.2 Recruitment and Enrollment: Using the evidence provided, discuss your program's enrollment trends over the past five years, including any trends related to diversity. What events are happening within the profession, local or broader community that might explain enrollment trends? What does evidence suggest might be future enrollment trends for your area over the next 3-5 years? What, if any, changes to recruitment strategies would benefit the program so that it attracts a sufficient number of students who are a good fit?

The evidence provided shows a balance in the White non-Hispanic ethnicity and a slight increase in the Hispanic ethnicity. The college is centered in a region where most of the population is Hispanic. The demographic from the table above shows Hispanics represent 56% of our area's enrollment. This is a similar representation of the region's population density of Hispanics.

The table above shows that the number of female students who enrolled in the emphasis area has been greater than the number of male students. This could be the future enrollment trend for the area over the next 3-5 years. We have been sending instructors and representatives from the math and science departments to high schools and recruitment events in Garden City as well as outside the city to promote our programs. Additionally, we have recruited students from high schools by having them come to the college and explore our programs.

D.3 Student Fit with Program Mission: Using the student data provided, analyze the quality of students typically enrolled in the program. What are the student qualities sought by the program and to what degree do students and graduates exemplify those qualities? What changes, if any, are desired in the type of student enrolled in the program?

Table D1 categories students in the program by gender and ethnicity. Most students in the program are Hispanic (88 students in 2017 – 2022, or 56%). This is followed by white, non-Hispanic ethnic group (36 students in 2017 – 2022, or 22.9%). We do have a good number of international students in the program (16 students in 2017 – 2022, or 10.2%). This shows that GCCC and specifically the Math Department have good features that attract students from around the world. At a closer look, we have more female than male students in the program. Female students and employees are underrepresented in STEM and related fields, so this data suggests that the number of female students who choose to study courses in Mathematics is on the rise.

Our program welcomes any student who has an interest and curiosity to learn about STEM, especially Mathematics. We offer basic to advanced courses to prepare students for classes they will be taking at a 4-year university. Most of the students who are in the program join the Math and Science Club. These students meet weekly to do cool activities and experiments, plan for field trips, and they sometime help with other activities that are happening on Campus. Some are part of the KS-LSAMP and Bridges programs. These students do research under faculty supervision, and they have a chance to present their findings at conferences later.

No changes have been considered for now. But we would like to see the number of female students in the program to keep growing. (see goals at end of document)

D.4 Student Organizations: Identify and describe any national professional, honorary, other student organizations and/or activities sponsored by the department or faculty members in the program which enrich a student's educational experience.

The Bridges to the Future is sponsored by a mathematics faculty member (Perla Salazar). This program is grant funded by the National Institutes of Health. The over-arching goal of Bridges to the Future is to increase the number of historically underrepresented students with baccalaureate degrees in the biomedical and behavioral sciences and to set into motion pathways designed to increase the number of Ph.D.s, M.D.s, and other professional doctorates in those fields. The NIH grant supports transfer students who are specifically, Latino, African-American, and Native American students who are U.S. citizens or permanent residents. Bridges provides a successful path for transfer students from southwest Kansas to begin their post-secondary pursuits at Garden City Community College (GCCC) followed by transition to Kansas State University after two years. As part of the federal grant, GCCC grants up to two student scholarships/stipends for STEM majors. Each student must work on a small research project throughout the academic year and develop a research proposal for submission to a national research conference. Additionally, students receive tutoring, advising, and work experience as lab assistants as needed. GCCC has been able to work with this grant for over 15 years.

The college's Science and Math Club is sponsored by a mathematics faculty member (Nicole Dick). This club is open to any student interested. Weekly, we meet to promote a learning and appreciation of science and math related topics. Our mission is:

> The Science and Math Club at Garden City Community College exists to promote a knowledge and appreciation of science and math among GCCC students.

Each year we assess our PLOs and provide activities for club members. These include engineering tasks, math competitions, club field trips, discussions, and more. The club is driven by members and their interests.

D.5 Student Assistance: Describe any special assistance or services provided by the department for your students (e.g., grants, scholarships, assistantships, tutorial help, job placement, advising and career planning, and awards), and in particular any services provided by the department for students with special needs, which facilitate student success.

Most full-time faculty members are advisors as well; after their first year or two of service they are taught to advise. By advising mathematics and pre-engineering majors with faculty members in those areas, we can help to keep advising mistakes to a minimum, stay up-to-date on transfer needs, and seek help from other advisors quickly when help is needed.

Our department also hosts a calculator rental program within our building. Since all mathematics class expect students to use a calculator, we've adopted a practice of by-semester rentals. This allows students to get the resource they need for a low price. By hosting this within our building, it is easier for faculty members to quickly help their students with calculator-related tasks and questions.

Bridges to the Future scholarship grants up to two student scholarships/stipends for STEM majors. Each student must work on a small research project throughout the academic year and develop a research proposal for submission to a national research conference. Additionally, students receive tutoring, advising, and work experience as lab assistants as needed.

D.6 Student and Alumni Achievement: Since the last program review, how have current students and/or alumni exemplified the mission and purpose of the program? In addition to discussing data produced above, this may include achieving influential positions, engaging in service or practice, acquiring advanced degrees or other significant scholarly accomplishments.

Feedback from two past students at GCCC:

- Strengths of the program include a strong emphasis on problem-solving and critical thinking skills, as well as a thorough understanding of mathematical and scientific concepts. I liked that it provided students with a solid foundation in the field, which can lead to a wide range of career opportunities.. As for suggestions for improving the program, it could include incorporating more hands-on, experiential learning opportunities and providing students with more resources to help us succeed.
- The program was a great start for someone who has no much experience in stem. I was very lucky to take both intermediate algebra and college algebra in the same semester. The main weakness would be lack of advanced courses since they are available at certain semesters, but the strength is having a high skilled professors. Probably adding a bit more courses or at least offering remote options would a good addition to students. I had a great time at GC3 and enjoyed working 1:1 with professors. I love the culture and people.

D.7 GPA Trend Analysis by Ethnicity: Data in the following table reflect the cumulative GPAs of students in the program compared to the overall institution (excluding new students without a GPA), disaggregated by ethnicity, for the five most recent years of fall enrollment. Fall enrollment data is a snapshot of enrollment as of Fall census.

GPA Trend										
	2017-18		2018-19		2019-20		2020-21		2021-22	
	Average GPA in major/ program	GCCC Avg	Average GPA in major/ program	GCCC Avg	Average GPA in major/ program	GCCC Avg	Average GPA in major/ program	GCCC Avg	Average GPA in major/ program	GCCC Avg
Non-resident (International)	2.257	2.942	1.818	3.003	2.400	3.137	3.584	3.236	3.380	3.054
Asian	3.300	3.303	3.030	3.249	2.855	3.127	3.763	3.189	3.135	3.088
Black, non-Hispanic	1.880	2.421	NA	NA	NA	NA	NA	NA	NA	NA
Hispanic	2.524	2.841	2.567	2.792	2.260	2.747	2.162	2.714	2.385	2.740
American Indian or Alaska Native	0.242	2.449	NA	NA	NA	NA	NA	NA	NA	NA
Native Hawaiian / Other Pacific Islander	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Two or more races	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Race/ethnicity Unknown	NA	NA	NA	NA	NA	NA	NA	NA	2.200	3.002
White, non-Hispanic	2.691	3.149	3.253	3.091	2.918	3.093	3.360	3.032	2.721	3.134
Female	3.375	3.033	3.205	3.016	2.959	2.944	2.638	2.905	3.294	2.907
Male	2.402	2.804	2.745	2.674	2.373	2.726	2.695	2.647	2.578	2.844

D.8 Completions Analysis by Ethnicity: The completions table includes program completers disaggregated by gender and ethnicity for the five most recent completion cycles. A completion cycle includes graduates from the program between July 1st and June 30th of each year. The ethnicity categories are based on IPEDS requirements. Therefore, International (non-resident alien) students will only be reported in this category regardless of their ethnicity.

Student Diversity—Completions											
	2017-18		2018-19		2019-20		2020-21		2021-22		Totals
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Non-resident (International)	0	0	0	0	0	0	0	0	0	0	0
Asian	0	1	0	0	0	1	0	0	0	1	3
Black, non-Hispanic	1	0	0	1	0	1	0	0	0	0	3
Hispanic	1	6	0	3	1	3	1	0	1	1	17
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0
Native Hawaiian / Other Pacific Islander	0	0	0	0	0	0	0	0	0	0	0
Two or more races	0	0	0	0	0	0	0	0	0	0	0

Race/ethnicity Unknown	0	0	0	0	0	0	0	0	0	0	0
White, non-Hispanic	0	1	0	2	2	1	0	0	0	1	7

*Data are based on past federal IPEDS reports. Whenever possible, programs should rely on the official IPEDS data. Given past variations in data collection report dates (e.g., inclusion of summer graduations), however, programs may supplement and elaborate on this exhibit with data they have kept internally.

D.9 Evidence of Successful Completion: The following tables provide year-to-year retention rates, graduation rates, and time-to-degree rates for the five most recent year's data. Retention and graduation rate tables include individual year counts and percentages as well as five-year averages of counts and percentages. The time-to-degree table includes the number of completers within the completion cycle and the median time to completion in years. A completion cycle includes graduates from the program between July 1st and June 30th of each year. Programs may provide other sources of data or evidence to demonstrate student success; please specify timeframes used in this analysis.

D-9a Retention Rates

One Year Retention Rate, Fall to Fall											
2017-18		2018-19		2019-20		2020-21		2021-22		5- Year Average	
# in Cohort	% retained	# in Cohort	% retained	# in Cohort	% retained	# in Cohort	% retained	# in Cohort	% retained	# in Cohort	% retained
44	47.73%	33	54.55%	29	31.03%	28	28.57%	23	34.78%	157	40.76%

D-9b Graduation Rate (150% of time)

Program 3-year graduation rates												
5-year total and average			Entering cohorts Fall semester									
			2017-18		2018-19		2019-20		2020-21		2021-22	
% Graduated	# in cohort	# Graduated	% graduated	# in cohort	% graduated	# in cohort	% graduated	# in cohort	% graduated	# in cohort	% graduated	# in cohort
17.20%	157	27	20.45%	44	27.27%	33	17.24%	29	0%	23	17.39%	23

D-9c Average semester credit hours for program graduates

Program Average Semester Credit Hours at Graduation
Academic Year Graduates – Average Institutional and Transfer In Hours

2017-18			2018-19			2019-20			2020-21			2021-22		
# Grad	Avg Inst SCH	Avg Tsf SCH	# Grad	Avg Inst SCH	Avg Tsf SCH	# Grad	Avg Inst SCH	Avg Tsf SCH	# Grad	Avg Inst SCH	Avg Tsf SCH	# Grad	Avg Inst SCH	Avg Tsf SCH
10	70.90	6.40	6	72	0	9	62.11	6.33	1	77	0	4	65.25	0

D-9d Program Graduates Time to Degree

Note: The time to degree cohorts are established at the time of graduation and are based on the students that graduated from the program within the year specified.

Time to degree (Exiting cohort) (July 1 – June 30)									
2017-18		2018-19		2019-20		2020-21		2021-22	
Median Time (years)	# Graduated	Median Time	# Graduated	Median Time	# Graduated	Median Time	# Graduated	Median Time	# Graduated
3	10	2	6	1	9	1	1	4	4

D.10

Retention and Student Success Analysis: Summarize and evaluate the effectiveness of the program's recruitment and retention efforts as it relates to enrolling and graduating students who fit the mission of the program. Identify any areas in need of improvement for producing successful students. In the analysis, address the following elements:

a. What does the evidence from above data suggest regarding how well your program is producing successful students?

We do not have a good system in place for gathering this data. A department goal will be to address this. Based on table D-9d, it does look like those students who finish our program do so in a short amount of time. Of the 5 years shown above, 3 years have median times of 2 or fewer years.

b. List specific events/activities that the program uses to increase student retention and degree completion.

Our department was a way of an issue with outdated course expectations on our degree plans. This problem will be resolved. During the 2021-22 school year much time was spent reviewing our 4- semester plan and implementing more realistic expectations that match what our student can do and what our students need at a 4-year school. We are hoping this increases our number of completers.

We've also reactivated Science and Math club since COVID-19 shut-down. For a year and a half the club did not meet. Having the club active and meeting weekly will hopefully encourage students to join and increase interest, and recruitment in our programs.

Another initiative is course placement. The college developed a multiple measures placement policy for math classes. This has resulted in more students being placed in higher level classes. While this doesn't affect many of our majors, it does help some to be able to make it to the higher-level classes sooner instead of not being able to make it at all.

c. Provide your best practices for tracking students who leave the program (without completing) and any follow up you may do with these students to determine why they have left.

We do not have any practices for this. This would be an excellent area to work on.

d. Identify any areas in need of improvement for producing successful students.

Our department (as well as many others), need a better system for alumni. Being able to stay in contact with them will help to inform future decisions.

Component E: Academic Opportunities and Class Size

E.1 Instruction Type: The following table includes the number of students enrolled by instruction types available through your department/program. Please add any additional data as applicable.

Special Study Option	Number of Students Who Participated/Number of SCH Generated for each Study Option Offered by the Program									
	Academic Year [17-18]		Academic Year [18-19]		Academic Year [19-20]		Academic Year [20-21]		Academic Year [21-22]	
	# of students	Total SCH	# of students	Total SCH	# of students	Total SCH	# of students	Total SCH	# of students	Total SCH
Outreach program (aggregate)	70	222	84	272	85	285	112	382	112	400
Concurrent Enrollment (at high school by high school – GC/SC/… sections)	70	222	84	272	85	285	110	376	100	362
Dual Credit Enrollment (on campus for high school - HS sections)	NA	NA	NA	NA	NA	NA	2	6	12	38
On-line courses-GCCC	181	543	232	700	325	975	449	1347	409	1227
On-line courses-EDUKAN (E1/E2/… sections)	52	176	NA	NA	NA	NA	NA	NA	NA	NA
On-line courses-Contract	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Face to Face courses	1673	5317	1348	4312	1098	3420	902	2812	789	2489
Internships/practical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Independent study, tutorials, or private instruction	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Developmental courses	1053	3159	815	2445	755	2265	651	1953	492	1476

E.2 Class Size Analysis: Based on the definitions provided below, the following table includes student counts in each class-size category for the past 5 years. Data are reported for the number of *class sections* and *class subsections* offered in each class size category. For example, a lecture class with 100 students which also met at other times in 5 separate labs with 20 students each lab is counted once in the "100+" column in the Class Sections column *and* 5 times under the "20-29" column in the Class Subsections table

Class Sections: A class section is an organized course offered for credit, identified by discipline and number, meeting at a stated time or times in a classroom or similar setting, and not a subsection such as a laboratory or discussion session. Class sections are defined as any sections in which at least one degree-seeking student is enrolled for credit. The following class sections are excluded: distance learning classes and noncredit classes and individual instruction such as dissertation or thesis research, music instruction, independent studies, internships, tutoring sessions, practica, etc. Each class section is counted only once.

Class Subsections: A class subsection includes any subdivision of a course, such as laboratory, recitation, discussion, etc.; subsections that are supplementary in nature and are scheduled to meet separately from the lecture portion of the course. Subsections are defined further as any subdivision of courses in which degree-seeking students are enrolled for credit. The following class subsections are excluded: *noncredit* classes as well as individual instruction such as, music instruction, or one-to-one readings. Each class subsection is counted only once.

No courses in the mathematics department have subsections.

Class Size per Academic Year								
	9 or less	10-19	20-29	30-39	40-49	50-99	100+	Totals
2017-18 Class Sections	46	35	51	NA	NA	NA	NA	132
~~2017-18 Class Sub-Sections~~								
2018-19 Class Sections	42	45	31	NA	NA	NA	NA	118
~~2018-19 Class Sub-Sections~~								
2019-20 Class Sections	38	42	21	NA	NA	NA	NA	111
~~2019-20 Class Sub-Sections~~								
2020-21 Class Sections	49	55	14	NA	NA	NA	NA	118
~~2020-21 Class Sub-Sections~~								
2021-22 Class Sections	70	51	7	NA	NA	NA	NA	128
~~2021-22 Class Sub-Sections~~								
Totals Across 5 Years	245	228	124	NA	NA	NA	NA	597

E.3 Non-credit Courses: Complete only if your department offered non-credit courses. If your department offered non-credit courses during the past 5 academic years, please use the chart below to list the course(s) and the number of students who *completed* the course.

No non-credit courses were offered by mathematics department during the last five years.

~~Non-credit Courses~~					
~~Academic Year~~	~~[Please fill in academic years, i.e. 15-16.]~~				
~~Course~~	~~# of students completing~~	~~# of students completing~~	~~# of students completing~~	~~# of students completing~~	~~# of students completing~~

E.4 Academic Opportunities and Class Size Analysis: Using the evidence provided in all exhibits above, discuss the trends in the program's class sizes and, if relevant, the impact on student learning and program effectiveness. Note, in particular, downward or upward trends in class size and provide justification for those trends. When possible, identify the impact of special study options and individualized instruction on program quality. Make certain you address, if appropriate, all off-campus and on-line courses and/or programs.

The outreach program has shown growth over the past 5 years. The online program has also grown. This is due to more offerings for these types of courses that were limited in the past. Our face-to-face courses have decreased. This is directly related to the increase of online courses. These past 5 years also spanned Covid-19. This is another factor. Our number of developmental courses offered has also decreased. We developed a new placement method that has helped students place in a higher course than our previous method. This factors into the decrease here.

Component F - Student and Constituent Feedback

F.1 Student Feedback: Summarize available findings that relate to program quality from student surveys, focus groups, exit interviews or other student sources. Include their perceptions of how well the program met their needs, the program's strengths and weaknesses, and suggestions for improving the program. Describe the ongoing mechanisms that are in place to acquire and utilize student feedback regarding program quality. What changes need to be made to meaningfully incorporate students into the program review process?

Most of our course evaluations are based on non-program classes, so using that feedback for the department is not ideal. That being said, student feedback is almost always positive and no overarching trends show.

F.2 Alumni Feedback: Summarize the results from available alumni surveys, focus groups, or advisory committees as it relates to program quality. When possible, include data indicating how well the program met the alums' goals and expectations, how well they think the program prepared them for next steps professionally and academically, and any program changes they recommend.

With the limited feedback we have, our program appears to be meeting student needs. Comments noted in feedback from students is either already being addressed, or is in error (advanced courses are offered almost every Fall and Spring semester). I would agree, that more hands-on experiences for students are worth pursuing.

Our main concern here is not having a sustainable and reliable method for gathering student feedback. This is a department goal.

F.3 Employer/Supervisor Feedback: Summarize the results from available surveys, job performance appraisals, intern or clinical supervisor evaluations, or other relevant data as it relates to student preparation or competence or program quality. Comment on the level of preparation given to students as a result of the program.

Not applicable.

F.4 Constituent Feedback Analysis: Analyze the program's overall effectiveness at utilizing student, alumni, and supervisor feedback as part of the assessment process. How well does the program solicit and respond to feedback, as well as communicate results of program review to its constituents, especially its current students?

This is not something the math program does well, or at all really. Most feedback is given at an individual level, not a department level. Our changes are implemented on small, usually instructor-only, level scales.

Component G - Resources and Institutional Capacities

G.1 Information Literacy and Library Resources: Information literacy can be understood as the ability to "recognize when information is needed and…to locate, evaluate, and use effectively the needed information" (from the Association of College and Research Libraries). Describe the degree to which library and information resources are adequate and available for students and faculty members in your department (onsite and remotely). What level of support and instruction is available to students and faculty in the areas of technology and information literacy? Provide examples of how students are meeting information literacy competencies and discuss the level of competency exhibited by students in the program. What resources are needed for your program in this area?

The Comprehensive Learning Center (CLC) offers tutoring and is based out of our library. This is probably the most used library service by our math department. I believe ever instructor, in some fashion, offers extra credit to students to use the CLC.

The library also provides students with access to Minitab, a data analysis program used by our MATH 110: Statistics courses as well as access to Lock-down browser for virtually-proctored testing.

G.2 Resource Analysis: Discuss the process used by program faculty to secure needed resources for the program. Include innovative strategies that have resulted in successful resource acquisition. Evaluate the program's effectiveness at securing necessary resources to ensure program quality. What systems or processes are working well, and what improvements could be made to make non-budgeted resource acquisition successful?

The GCCC Budget planning process is what our departments use for funding requests. https://www.gcccks.edu/about_gccc/policies/budget_planning_policy.pdf

Faculty within the math department have also written grants for resources. Current practices are fairly successful in getting what our department needs. When new initiatives are brought forward, if they can't be covered by local grants, then we occasionally use SGA and Science and Math Club or LSAMP/Bridges to help start processes.

G.3 Revenue and Expense Analysis: Program data from at least five academic years provided by Dean of Academics.

	2018	2019	2020	2021	2022
Tuition	358558.00	321470.00	301096.00	290604.00	301096.00
State	213367.44	200803.68	176519.97	170077.05	176080.41
Total Instruction	**571925.44**	**522273.68**	**477615.97**	**460681.05**	**477176.41**
State-Instructional Support	92322.45	77094.27	69971.88	69775.20	69797.64
State-Institutional Support	102580.50	93230.28	84284.31	82858.05	84074.43
Fees	205730.00	205530.00	231992.00	242964.00	261608.00
Total GCCC Support	**400632.95**	**375854.55**	**386248.19**	**395597.25**	**415480.07**
Total Financial Impact	**972558.39**	**898128.23**	**863864.16**	**856278.30**	**892656.48**

Salaries & Benefits	**350405.14**	**363338.57**	**358608.61**	**380648.89**	**409450.55**

G.4 Analysis of Acquired Resources: Since the last program review, identify each major program resource acquisition and its direct or indirect impact on program growth or improved quality. Discussions of impact should include the measurable effect of acquisitions such as new faculty, staff, equipment, designated classroom/office space, non-budgeted monies, awarded grants, scholarships, and other acquisitions by the program or faculty on student learning, enrollment, retention, revenue or other program indicators of educational effectiveness. Justify the program's use of resources through this analysis. When appropriate, discuss resource acquisitions that did not positively impact the program.

The number of faculty members has stayed the same in the mathematics department. Any resignations were replaced for the following school year. There was one year (2020-21) where we did not have a Physics instructor. Despite looking for an instructor, we were not successful in hiring one. We are grateful that administration agreed that having Physics was important to the success of both having math and pre-engineering programs. And for the following year (2021-22) we advertised again, hired successfully and have our physics instructor in place. Currently we still see a low number of students enrolled in our pre-engineering program. Faculty have made efforts to work with four-years and offer more transferable, engineering-related courses as well to restructure our 4-semester plans to better serve students.

Without acquiring major physical program resources, we have no successes or failures to discuss.

G.5 Resource Allocation Relative to Capacity: Analyze trends in the program's operational budget as it relates to program enrollment, emerging needs, and program goals. Has the budget increased or decreased in proportionate response to program growth? Using evidence obtained from this review and other data, discuss your program's enrollment trends and/or revenue streams as it relates to non-budgetary resource allocation. In other words, if the program has reduced enrollment or income, what steps have been taken to correct resource allocations or expenses; if the program has increased in size or income, what resources or capacities are needed to meet new demand? What is the impact of budget changes on educational effectiveness? For each necessary capacity, rank order its importance relative to other needs and estimate its cost. Describe planned efforts to obtain funding for these needed capacities.

The mathematics program, while having a very low number of students, serves many students on campus through General Education requirements. This can in part be seen by table G.3 above. Our department has a positive financial impact on the college due to the gen-ed needs of all AA, AS, AAS, and AGS degrees.

If our program increases in size, we will not need any direct increases to budget. Currently our upper-level classes have enrollments of 12 or lower. Since class capacity is set to 24, we have a lot of room for growth with our current staff and classroom space.

Summary Conclusions

Summarize the major findings of the program review as it relates to both the strengths of the program and areas in need of improvement. Include in this discussion any "intangibles" or assessments that you wish to discuss that were not requested in the Program Review Report. Make sure your conclusions are based on evidence.

With the understanding that the math and pre-engineering programs do not serve many program students, however we do serve many students in a general education sense, here are some summaries.

Overall, our program students seem to be successful and satisfied with their classes and instructors. This is evidenced by data from B.9, the faculty has high quality where most students are satisfied with the faculty's teaching.

Despite stereotypes about who typically pursues STEM related fields, and probably due largely to the cultural make-up of SWKS, table D.1 shows the student enrollment by gender and ethnicity and that there has been an increase in Hispanic enrollment over the years.

A common problem throughout much of our report that could be addressed is to create a method for tracking alumni and create a system for gathering data on tracking successful students. This is reflected in our Program Goals – Component Area F.

Program Goals with Recommended Action Steps

Program Name: Mathematics and Pre-Engineering *Date*: Spring 2023

Include this document with your Program Review Report. Considering the totality of the program review report, use the table to set goals that, if met, would result in improved student learning, increased enrollment, retention, revenue, or other program indicators of success. Set reasonable, measurable, and achievable goals and identify clear action steps needed to obtain the goal. **This information serves as the basis for the Dean's Administrative Response, as well as ongoing strategic planning processes.**

(Attach ***this*** year's "Program Goals with Recommended Action Steps" as Template Appendix A in your program's ***next*** program review. See "Schedule for Academic Programs", Appendix A in the Academic Program Review Manual for dates of your next review. You may add rows to this table as needed.

Component Area	Specific Goal or Desired Outcome to Maintain or Improve Program Quality.	Activity or Strategies to Achieve Goal (include responsible person)	Proposed start and end dates	Progress Metrics and timeframe for measurement	Resource requirement (in-kind & direct)	Priority of Resource Allocation (High, Medium, Low.)	Anticipated Impact on Educational Effectiveness & relation to GCCC Skills
A - Mission and Context							
B - Faculty Characteristics and Qualifications	Research and consider hiring a nonmasters, math teacher whose focus in developmental education.	Look at peer institutions ; Look at our data on student success in developmental classes and identify barriers to success – math department	Spring 2023 and ongoing. Hire in Spring 2024.	Department meeting minutes showing discussion and research. Job description and posting. Interviews and hire.	Funding for new mathematics position.	Medium	Would directly impact student success. Would assist current math department in developing corequisite classes
C - Quality of Curriculum and Student Learning	Continue to research and develop corequisite classes	Look at peer institutions ; Look at our data on student success in developmental classes and identify barriers to success; make decision on current MATH 108C; redesign and develop coreq classes for rest of sequence as needed – math department	Spring 2023 and ongoing. New pathways effective Fall 2025	Department meeting minutes showing discussion and research. Pilot classes with data showing success. New classes through C&I as well as on line schedules.	None	High	Would directly impact student success and hopefully lessen time to complete associate's degree

D - Student Enrollment and Success	Increase proportion of females in program	HS recruiting trips and events, include male and female GCCC representatives	Fall 2023 and ongoing	Annual reports and next 5-year program review	Those already in place and needed for recruitment	Low	Increase enrollment
E - Academic Opportunities and Class Size							
F - Student and Constituent Feedback	Create an alumni feedback system	Work with Dean of Advancement and Alumni Creations and Assessment Coordinator to create an effective and sustainable program to gain alumni feedback and successes	Spring 2023 and ongoing. Hope to have data to report on next Program Review and program Assessment, Spring 2024	Department meeting minutes showing discussion and research. Minutes from meeting with Dean. Draft versions of program/questions/plan. Implementation of sustainable process	None known	Low	In the classroom, this might change what is done, but this probably affects our program course offerings and expectations. May also affect the extracurricular activities and clubs we offer.
G - Resources and Institutional Capacities							
Summary Conclusions							

Template Appendix A

Program Goals with Recommended Action Steps—From Previous Review

Attach this document with your Program Review Report for Section A.2 above.

Component Area	Specific Goal or Desired Outcome to Maintain or Improve Program Emphasis Area Quality.	Activity or Strategies to Achieve Goal (include responsible person)	Proposed start and end dates	Progress Metrics and timeframe for measurement	Resource requirement (in-kind & direct)	Priority of Resource Allocation (High, Medium, Low.)	Anticipated Impact on Educational Effectiveness & relation to GCCC Skills
A - Mission and Context	Rewrite math department mission statement.	Full time math faculty will review current mission statement, use Assessment Training workbook to rewrite.	Start and complete in August 2018	NA This can be done in one session	NA	Low	Connections to college mission ad course SLO's will be easier to identify.
B - Faculty Characteristics and Qualifications	Continue to peruse professional development	Attend conferences through year, either in person or web-based	Ongoing for 18-19 school year	Requests to Faculty Senate for funds throughout year	Funding for conferences, through FS	Medium	Keep teachers aware of current trends and strategies in math ed
C - Quality of Curriculum and Student Learning	Update PLOs and increase the success rates	Revisit the wording of PLOs and how we measure them	Ongoing for 18-19 school year	Rewrite in Fall 18	NA	Medium	Will make it easier to show math/pre-eng students are successful
D - Student Enrollment and Success	Increase student recruitment in high schools in the surrounding areas.	Establish connections with high schools in surrounding areas, let them know the opportunities & scholarships available. Scholarship directors will invite HS students to Discovery Day.	Ongoing for 18-19 school year	Recruiting will start at the beginning of fall and continue through discovery day. Follow ups with interested students will happen in the spring.	Recruiting materials from admissions. Printing from the copy center.	Low	Increase program oriented recruitment will improve enrollment in higher-level math and science courses.

Component Area	Specific Goal or Desired Outcome to Maintain or Improve Program Emphasis Area Quality.	Activity or Strategies to Achieve Goal (include responsible person)	Proposed start and end dates	Progress Metrics and timeframe for measurement	Resource requirement (in-kind & direct)	Priority of Resource Allocation (High, Medium, Low.)	Anticipated Impact on Educational Effectiveness & relation to GCCC Skills
E - Academic Opportunities and Class Size	Lower class size in developmental classes	Review success rates and class size at peer schools	Start: SP18 Complete: before F18	Class size will be lowered on course schedule	More sections may need to be offered for developmental classes	Medium	With smaller classes, faculty can better meet the diverse needs of developmental math students
F - Student and Constituent Feedback	Establish a method of gaining feedback	Research peer schools and begin to gather non-academic contact information from students	Start: SP18 Ongoing	By end of SP19, should have some means to contact alumni	Possible survey/letter	Medium	Will also us to track if our graduates are successful at the next level.
G - Resources and Institutional Capacities	Math department will provide a software (WebAssign/ Canvas) workshop for math students prior to the start of Fall 18	All math faculty will provided topics to be discussed in the workshop. Workshop will take place during new student orientation.	Start and complete in August 2018	Workshop will be designed and delivered August 2018. This workshop can be used to inform future workshops for incoming freshman.	Online resources. Student accessibility to their canvas accounts. Good internet connection. Possible computer lab or other technology accessibility.	Medium	Workshop should reduce student software issues and allow class to be subject focused at the start of the semester rather than time being used for troubleshooting.
Summary Conclusions	Overall, math department is doing well. There are enough teachers,	Most strategies can be implemented by math faculty with some research.	Within coming school year.	Varies	Nothing of too much money, mostly time is needed.	Varies	All these goals will increase the success of the math/pre-eng departments

	and students' needs are being met.						and thus increase college success.

Template Appendix B

Administrative Response Sheet—From Previous Review

Attach this document with your Program Review Report for Section A.2 above.

Template Appendix C

Annual Assessment Reports—Since Last Program Review

Attach the program's Annual Reports for the last 5 years or since the last program review.

See file: Program Assessment Math PreEng for 2023 Program Review.xlsx

Template Appendix D

Strategic Plan and Status Reports Since Last Review

Attach the program's Strategic Plan and Status Reports for the last 5 years or since the last program review.