Program Review, Analysis, and Planning

Department Name: Mathematics Department

Data Analysis

Based on data provided by ORPIE:

1. Are your department's average FTES/FTEF and average enrollment per section lower, higher, or similar to college-wide average FTES/FTEF and average enrollment per section? Why? (150 words limit)

   During 2017-2018, the Mathematics Department's average FTES/FTEF of 36.7 and average enrollment per section of 45 are both higher than college-wide average FTES/FTEF (33) and average enrollment per section (37). Over the three-year period since 2015, the Math Department's enrollment per section average was 47, and FTES/FTEF was 38, each also higher than college-wide averages.

   One explanation, for the larger average enrollment per section and larger FTES in mathematics courses than in courses college-wide, is that mathematics courses are required for the majority of students' general education, while other campus courses are not required for all majors. Another factor is large class sizes in many of the mathematics courses. Math G115 and Math G160 courses have a maximum class size of 72 students where some courses have class sizes of 36.

2. What factors have contributed to your trends in enrollment? If your department is experiencing an enrollment decline, what is your department's plan to address the enrollment decline? (150 words limit)

   In 2017-2018, the Department experienced a decline of 11.77% in overall enrollment. This is a common trend for all community colleges. A main factor for this trend is the improving economy. When the economy is strong, and the unemployment rate is low, the enrollment in community colleges is declined. To accommodate the busy schedule of working adults, the Department offered a pilot online section of Statistics during the winter 2019 and spring 2019 semester. The Department will offer online sections for College Algebra, Trigonometry, and Statistics in fall 2019. In addition, the Department is going to partner with Huntington Beach Union High School District (HBUHSD) for dual enrollment. Beginning fall 2019, HBUHSD students will have an opportunity to participate in dual enrollment Statistics course with GWC. The Department will also continue adding more sections to strong demand courses as the Department has been doing since 2016.

3. Looking at the demographic of your student population, what strategies has your department considered or implemented to be more inclusive of the distinct student populations you serve? (250 words limit)

In fall 2018, our department partnered with the equity team. The team began the semester with observations on the first day of class and gave each observed instructor a report on how we could make the classroom a more equitable environment. We analyzed the demographics that were being underserved and discussed strategies we could use to improve their success rates. Some of the strategies that have been implemented are re-formatting syllabi, using more inclusive language, rearranging chairs, and utilizing OER. We continue to discuss making our college a more equitable environment at our department meetings and are hopeful that the changes being made with AB 705 will contribute to equity in success rates.

4. How does your program course success rate compare to GWC's overall course success rate? If your course success rates are in decline or below the college average, what is your department plan to address the success rate? (250 words limit)

For 2017-18, the math department success rate was 55.9% as compared to the college's success rate was 72.2%. These success rates represent transfer level and developmental math courses combined. This results in a 16.3% success gap. To address this success gap as well as meet the new requirements, the math department has taken the following steps.

- Implemented acceleration courses in 2017-18 including Math 40 and Math 80
- Implemented the PASS and Embedded Tutoring programs
- Attend statewide CAP conferences to learn statewide best practices
- Met at least monthly to design and develop co-requisite curriculum
- Wrote CORs for co-requisites to be implemented in Fall 2019
- Collaborative planning to develop co-requisite curriculum and learning experiences

In addition to the above steps, the recent reformation of developmental and transfer level math teams will support deeper collaboration and vertically aligned work to increase success rates across the department.

5. Looking at success rates for different demographic groups, which groups are experiencing disproportionate impact in student success? If there are student groups experiencing disproportionate impact, what is your department's plan to address the disproportionate impact? (250 words limit)

   Based on the Program Review-Summary Scoreboard, the largest disproportionately Impacted (DI) groups in 2017-2018 Academic Years were Hispanic/Latinx, Man, Economically Disadvantaged, DSPS, Foster Youth and CalWORKs. Most of the above students were Hispanic/Latinx, Man and Economically Disadvantaged students.

   The adjustments made in the math department at GWC include student-centered curriculum, mastery learning tools and collaborative experiences, all aiming towards closing the PPG (Percentage Point Gap). More personalized study plans, just in time remediation in corequisite courses and workshops will be developed to address the DI groups' academic challenges. This work will occur in all math levels, but with a heightened focus on AB 705 courses and co-requisites.

   To close the PPG, math department has been and will be providing extra tutoring assistance for the DI students. The extra help includes offering PASS (Peer Assisted Study Sessions) Program and SI (Supplemental Instruction) which are recently evolved into Embedded Tutoring. In addition, adapting the textbooks through OER (Open Education Resources) with zero cost for the students has been in the top of the list of considerations in math department. Most math instructors invite the DSPS and also EOPS (Extended Opportunities and Program Services) counselors to their classes, and the counselors inform the students about the benefits of applying for EOPS. Foster Youth and CalWORKs are among EOPS programs. The department will continue discussions regarding partnerships with organizations that encourage Hispanic/Latino and other minority groups to pursue STEM education and career paths.

   The two newly established clubs, Engineering and Math Clubs at GWC, will hopefully encourage more students to study math and engineering in the future, and also assist the students with all of the available resources at our campus.

6. Does your department confer a degree or certificate? What is your department's plan to increase the number of students receiving degrees or certificates? (150 words limit)

   Since the last PR cycle (2016), there has been an increase in the number of students receiving an AA or ADT in mathematics. More specifically, there were 12 students that received an AA Degree in mathematics and 42 students received an ADT in mathematics. The department did not confer any certificates during this time.

   The department will continue to promote mathematics as a degree option along with the career opportunities that are open to a student with a mathematics degree. The department will also continue to examine the feasibility of offering certificates for a sequence of course completions.

Our partnerships with local high schools (via dual enrollment agreements) and with universities (via project RAISE @ CSUF and project BUILD @ CSULB) will further promote, develop and implement a pathway towards increased local and transfer degrees in mathematics. We will further investigate and plan sequential course development specific towards certificates and CTE program completion.

7. Are students transferring to four-year institutions from your program? What is your department's plan to increase the number of students transferring to a four-year institution? (150 words limit)

   In 2017-18, there is no explicit data available on the number of students who transferred to a four-year university. That said, in 2017-18, 5 AA degrees and 15 ADT degrees were awarded in mathematics as compared to the 860 AA and 544 ADT degrees campus wide. To increase this number of students transferring to four-year institutions, the department will focus on increasing success rates as well as students' interest in mathematics. This will be worked towards through ongoing professional learning and development, collaboration through department meetings, looking at real-time data and implementing interventions on an ongoing basis.

   To increase success rates, we are implementing the same action steps as listed in number four above. To increase students' interest and confidence in mathematics, the department continues to expand its outreach in high schools including adding dual enrollment district-wide. We have also formed a Math Club on campus to foster and develop students' interest in the subject. Finally, the move in of the new math and science building on campus will support the effort of increasing student interest.

8. Did you complete the two-year program review requirement for CTE? If no, why not? (150 words limit)

   N/A

9. Did your department complete all course SLOs assessment? If no, why not? (150 words limit)

   Yes, our department has completed all course SLOs assessment.

10. Did your department review all Course Outline of Records in the last 6 years? If no, why not?

    In the last six years, the Mathematics Department has updated all Course Outlines of Records, with the exception of four courses: Math 9 Medication Calculations for Nurses, Math 10 Elementary Algebra, Math 30 Elementary Algebra, and Math 282 Ordinary Differential Equations.

    Math 9 is currently being retired as a course in support of the Nursing Department's implementation of Medication Calculations for Nurses, with some modifications, for the accessibility of their students.

    Math 10 and 30's dormant state can be attributed to the transitions the Mathematics Department has been through the past six years, i.e. separating into two departments (Remedial Mathematics and Transfer Mathematics) and soon back to one department. Through this evolution it can be understandable Course Outlines of Record were not updated due to the hiring of new faculty with a goal of creating innovative methods and programs to aid students with successfully getting through the remedial sequence. Recently, AB705 has

been a primary focus. Creating and implementing support courses to aid students through their mathematics requirement within the new state regulations by fall 2019 was priority one. Ultimately, because of these new state regulations Math 10 may eventually become retired as a course. The department would like to see the results of AB705 before such a major change is made to its COR.

Math 282 has been a low enrollment course and rarely been offered. This can be attributed to students having a greater desire to enroll in the hybrid course Math 285 Introduction to Linear Algebra and Differential Equations.

Review of Last Cycle Program Review

Provide assessment of your previous program review initiatives. Summarize any accomplishments that your program achieved (List 3 to 5 bullet points). Limit to 250 words.

Based on our previous program review initiatives, the summary of the accomplishments of our program is provided below:

- Refined Jumpstart through career pathways to address two needs: placing out of developmental math coursework and increasing access to a career pathway of interest and/or talent.
- Implemented PASS/Supplemental instruction in most developmental math courses.
- Piloted and implemented innovative practices: PASS leaders, Jumpstart, and Mastery Learning.
- Provided free access to ALEKS for all PASS leaders and for students participating in Jumpstart.
- Continued to refine our curriculum and develop new ones and reviewed and revised some of the CORs for better alignment with C-ID descriptors.
- Established a department SharePoint portal and began sharing of resources and strategies that proved to be effective with students and faculty.

Moreover, these are additional accomplishments that our department has achieved during the last three years:

- Offer embedded tutoring in a number of our math courses.
- Collaborate with our District's T.I.E.S. program to mentor interns during the spring semesters.
- Provide scientific and graphing calculators at our math lab and the STEM center for our students to borrow and use inside and outside the classrooms.
- Write co-requisite courses for three transfer level courses, Math G115 (College Algebra), Math G120 (Trigonometry), and Math G160 (Introduction to Statistics) to comply with AB 705. These co-requisites are Math G091 (for Math G115), Math G092 (for Math G120), and Math G096 (for Math G160).
- Work with the Equity Squad at GWC to improve our student success rates and be a more equity-minded team.

PROGRAM PLANNING/BRAIN STORMING

Based on your analysis of previous program review and current data, list 3-5 goals that your department want to accomplish in the next three years?

Based on our analysis of previous program review and current data, these are five goals that our department wants to accomplish in the next three years:

- Offer online courses for a few math courses, such as Math G115 (College Algebra) and Math G120 (Trigonometry).
- To comply with AB 705, offer co-requisites for three transfer level courses, Math G115 (College Algebra), Math G120 (Trigonometry), and Math G160 (Introduction to Statistics). The co-requisite numbers for these courses are Math G091 (co-requisite for Math G115), Math G092 (co-requisite for Math G120), and Math G096 (co-requisite for Math G160). In addition, compare and track the students' success rates in these classes offered with and without co-requisites.
- Start offering dual enrollment math courses by collaborating with the HBUHSD (Huntington Beach Unified High School District) to offer dual enrollment courses, such as Math G160 (Introduction to Statistics), at the high schools of this district.
- Enhance our collaboration with the other departments of the Math and Sciences Division (Science Showtime, STEM Newsletter, STEM Center, and more), other departments/programs at GWC (CCD, RCC, Counseling, DSPS, Equity Squad, dual enrollment, guided pathways, and more), and the CCCD district (T.I.E.S. program, collaboration & meetings with OCC & CCC math departments, and more) to help our students succeed.

Since our department will be a math and engineering department, one of our goals will be to offer more engineering courses, such as ENGR G220 (Programming and Problem-Solving in MATLAB), ENGR G280 (Statics), and ENGR G285 (Engineering Circuits).

Program Planning

Description of Department's Goal?	What metric will you use to measure your goal?	What actions will the department take?	Which of the College's mission and goal does this goal support?		List necessary support and/or resources if applicable.
Goal 1: Increase accessibility of math course offering to working students or for students who prefer online courses.	We will offer online courses for Math G115 (College Algebra) and Math G120 (Trigonometry).	Our department will start offering these courses during the summer and fall 2019 semester.	☐ Transfer ☐ Degrees ☐ Certificates ☐ Career advancement ☒ College readiness	☒ Student Success ☒ Equitable Achievement ☒Learning Environment ☒ Communication ☐ Engagement ☒ Resource Optimization	Our department will need funding for professional development, on-line teaching training, and other resources for both full-time and part-time faculty.
Goal 2: Increase course success rates and ensure compliance with AB705 requirements.	We will offer co-requisites for three transfer level courses, Math G115 (College Algebra), Math G120 (Trigonometry), and Math G160 (Introduction to Statistics). The co-requisite numbers for these courses are Math G091 (co-requisite for Math G115), Math G092 (co-requisite for Math G120), and Math G096 (co-requisite for Math G160).	Our department will offer these co-requisites to comply with AB 705. Furthermore, our department will compare and track the students' success rates in these classes offered with and without co-requisites.	☐ Transfer ☐ Degrees ☐ Certificates ☐ Career advancement ☒ College readiness	☒ Student Success ☒ Equitable Achievement ☒Learning Environment ☒ Communication ☐ Engagement ☒ Resource Optimization	Our department will need funding for embedded tutoring, a math center, and other additional resources to help our students succeed in these courses.

Goal 3: Increase student interest and enrollment in Mathematics through dual enrollment partnership with local high school districts.	Collaborate with the HBUHSD (Huntington Beach Unified High School District) to offer dual enrollment courses, such as Math G160 (Introduction to Statistics), at the high schools of this district.	Our department will work with the GWC dual enrollment program to collaborate with the HBUHSD and offer Math G160 (Introduction to Statistics) as a dual enrollment course.	☐ Transfer ☐ Degrees ☐ Certificates ☐ Career advancement ☒ College readiness	☒ Student Success ☒ Equitable Achievement ☒Learning Environment ☒ Communication ☐ Engagement ☒ Resource Optimization	Our department will need funding for professional development, training, and other resources for both full-time and part-time faculty.
Goal 4: Enhance our collaboration with the other departments of the Math and Sciences Division, other departments/programs at GWC, and the CCCD district to help our students succeed.	Our department will continue our partnership with the other departments of the Math and Sciences Division in participating in the Science Showtime event, writing/publishing the STEM Newsletter, and plan the use/purpose of the new STEM Center, and more). We will collaborate with other departments at GWC, such as CCD, RCC, Counseling, DSPS, Equity Squad, dual enrollment, guided pathways, and more. Moreover, our participation with the CCCD district programs, such as the T.I.E.S. program, will continue to help our students succeed.	Our department will participate in the Science Showtime event, write/publish the STEM Newsletter, and engage in planning the use/purpose of the new STEM Center. We will collaborate with other departments at GWC, such as CCD, RCC, Counseling, DSPS, Equity Squad, dual enrollment, guided pathways, and will invite them to give presentations in our classrooms to educate our students about the services/resources that are available for them. Our participation with the CCCD district programs, such as the T.I.E.S. program, will continue to help our students succeed.	☐ Transfer ☐ Degrees ☐ Certificates ☐ Career advancement ☒ College readiness	☒ Student Success ☒ Equitable Achievement ☒Learning Environment ☒ Communication ☐ Engagement ☒ Resource Optimization	Our department will need funding for professional development, training, and other resources for both full-time and part-time faculty.

Goal 5: Establish and strengthen the new engineering program at GWC.	Our goal is to offer engineering courses, such as ENGR G220 (Programming and Problem-Solving in MATLAB), ENGR G280 (Statics), and ENGR G285 (Engineering Circuits).	Our department will work with the GWC CCI to align the curriculum of these courses based on the most recent C-ID requirements.	☐ Transfer ☐ Degrees ☐ Certificates ☐ Career advancement ☒ College readiness	☒ Student Success ☒ Equitable Achievement ☒Learning Environment ☒ Communication ☐ Engagement ☒ Resource Optimization	We will need funding for professional development, training, supplies, equipment, and other resources for the engineering program. Moreover, we will need a full-time engineering faculty to teach these classes at GWC.