Program Review Report

Program: **Bachelor & Associate of Math**
College: **Department of Math and Physical Sciences**
Review Date: **April 29, 2020**

Summary:

A program review for the Program of Study (POS) in Math, offered as two different degrees: the bachelor of science and the associate of science in Math- was presented to the Program Review Committee by Dr. David Torres, Chair of the Department of Math and Physical Science Department.

The calculated three-year average of declared student enrollment in the bachelor program is 9.3 (headcounts) per year and it has been decreasing to a current headcount of 5 students. The one-year fall-to-fall retention rate is 80%. Although retention is good, the review showed that students take between 4 and 8 years to graduate. The associate degree three-year average of declared headcounts is 1 student per year.

Both degrees in this POS have good job projections and a high student demand according to the analysis done by Gray Associate Program Demand software. The associate degree had a scorecard with 28 points while the bachelor's degree has 31. However, there is an important competition identified for this POS in the region from other institutions. This could explain why the historic enrollment of this program has been very low.

The program economics based on Gray Associates software shows a *negative* contribution margin (including overhead) $81,677 for this program during the academic years of 2016-2019. This deficit would probably continue to increase for the bachelor program since the current collective bargaining agreement requires the institution to pay all overloads while in prior years some faculty volunteered to teach some upper-division courses without additional pay. The ratio between gross revenue (tuition/fees) and instructional cost is 0.39 for the last three years. Recently, these overloads have been paid at prorated scale because the enrollment has not met a minimum of ten students.

The POS in Math is a broad-based program and prepares students to pursue a career in mathematics or a mathematics-related field and emphasizes applied mathematics courses including ordinary differential equations, linear algebra, numerical analysis, partial differential equations, and probability and statistics. It also offers an optional concentration in Physics.

Unfortunately, the review for both degrees failed to demonstrate any student learning outcome assessment done in previous years. Therefore, the Committee had no direct evidence of continuous improvement processes or any other academic indicators of program-level student learning outcomes assessment. However, the Department of Math has collaborated with college-wide student outcomes assessment for General Education courses and established a program-level assessment plan that is currently in implementation and will be continued in the next years.

The POS does not have a well-established external advisory committee that meets annually, although two faculty members from state universities have provided input to the degrees. Moreover, the Department does not track employer satisfaction for their graduates.

With the exception to diversify math course offerings to include data science, the program review document did not provide a strategic plan for the years to come.

Recommendations:

The Council of Chairs is concerned with the financial sustainability of the bachelor degree offering and the lack of quality assessment. Similarly, the two degrees failed to demonstrate a relevant strategic plan to guarantee innovation, envision the next steps, and improve enrollment. Therefore, the Council is recommending two-year probation for the associate degree program and the immediate suspension of the bachelor degree program. Past experience with other struggling programs indicates significant human resources and financial allocations are needed to redirect how a program is developed, marketed, delivered, and assessed. Given the high allocation of human resources from the Department of Math and Physical Sciences to the General Education endeavor, it is not realistic that the quality assurance processes for the bachelor program can be implemented without new investments. New, and even some continued, investments are very difficult to justify under the current financial constraints of the institution and the lack of student enrollment in the program. The suspension recommendation will need to be approved by the College President and the Board of Regents. The following steps need to be taken by the faculty associated with the Math degrees.

1. If the Board of Regents approves the suspension of the bachelor program, a reduction in force of 1 full-time faculty member will be implemented by Fall 2020.
2. By Fall 2020, no new students will be accepted into the bachelor program and the Department Chair will need to immediately develop a teach-out plan for the current declared students in the program.
3. By Spring 2021, the enrollment for the associate degree in Math should be at least 5 declared FTE students (not headcounts).
4. By Spring 2022, the enrollment for the associate degree in Math should be at least 10 declared FTE students.
5. Starting in Fall 2020, the program needs to have a formal External Advisory Committee (EAC) with at least one member who represents a relevant employer in the region and one participant from a local high school provider.
6. The EAC shall meet at least once per academic year with the faculty of the Math program and the meetings need to be documented with minutes and sign-in sheets to show attendance. The EAC and the faculty should work together to develop the mission and vision of the program.
7. The associate degree must demonstrate, through the Annual Report, significant yearly progress using multiple data sources aggregated with other information to ensure course and program relevance to local needs and industry. All assessment data related to program-level student learning outcomes must be delivered with the Annual Report. Similarly, other relevant data needs to be collected including feedback from employers, alumni, students completing the program, and outside industry-related experts.
8. Faculty in the program must collaborate with other departments to develop articulation agreements between the associate degree in Math and available bachelor programs.
9. Starting in Fall 2020, the associate degree program must implement a class observation system to evaluate the instructors that teach in this program.
10. A program analysis through Gray Associates software should be developed no later than June 30, 2021, to determine any Math concentrations or minors that could be introduced in partnership

with other programs offered at NNMC. This effort must be incorporated into a Strategic Plan that addresses quality, enrollment, and future directions (also to be completed by June 30, 2021).

11. The Math department must engage with other academic departments, like Teacher Education and Engineering, to discuss the offerings of upper-division courses needed for those programs. This work could potentially open the door to the consideration of future offerings of minors or concentrations in Math for other programs.

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Provost & VP Academic Affairs