The purpose of this study is to evaluate the relationship of each mathematics courses to the Civil Electrical, and Mechanical Engineering curricula so as to assess the substantive value that the duly accredited mathematics courses have contributed in the strengthening of the Bachelor of Science in Engineering Programs.

Specific Problems:

1. What is the Grade-Point-Average (GPA)of the Engineering students in the mathematics courses in the Civil Electrical and Mechanical Programs?
2. Are there significant intercorrelations between the basic mathematics courses?
3. Are there significant intercorrelations among the different basic mathematics and professional Engineering courses?
4. What Mathematics courses singly and in combination are related to the Engineering degree programs?

Methodology

This study is and Ex-post Facto type of descriptive research that investigates the effect of the mathematics courses in promoting a progressive curriculum in the Engineering Degree Programs. It analyzes the individual and combined contribution of the mathematics courses in enhancing the professional Engineering courses.

Sources of Data

The documentary files on report of ratings of NWC Engineering students were the primary sources of data. Grading sheets and students transcript of records were perused to determine the performance of the students. The ratings in Mathematics and in Engineering courses from first year to their fifth year served as the unit of analysis of this study.
Statistical Treatment of Data

The mean and standard deviation were used to determine the mean achievement of the students on the subject courses under study. The Pearson r was employed to determine the effect/relationship between the basic mathematics subject, and among the different Engineering courses. Multiple regression analysis was applied to determine the wholistic effect of all mathematics courses on the professional courses.

Findings

1. The lowest academic performance of the students of Electrical and Civil Engineering is in Math 11 which is (2.97) and likewise Mechanical Engineering which is (2.95). The highest mean GPA for Electrical, Mechanical, and Civil Engineering is 2.83, 2.66 and 2.40, respectively in their Math 16.
2. The relationship between the two Math courses of the Electrical Engineering show a generally positive linear correlation except those of Math 12 and 13 which is inverse (-0.1799) but not significant. The Mechanical Engineering shows a positive correlation except Math 11 and 12, Civil Engineering shows that all the Math courses offered are very complementary.
3. The relationship between basic mathematics and professional courses taken in the Electrical Engineering programs (63%) shows that there is a greater proportion of linear co-variation than inverse relation (52.46%) is greater than the linear co-variation (47.54%).
4. Mathematic courses as determinants of performance in major courses of Engineering could not be evaluated due to the reduction of cases. Of the 270 students enrolled as Engineering freshmen (SY1986-1987) only 28 students survived thereby reducing the cases required to achieve a tolerable level of statistical significance. Nevertheless, among the Electrical students, Math 11, 13 and 15 positively enhance the courses Mech. 1, EE 326, EE 413 and ECO 11. For the Civil Engineering- Math 11, 12, 14 and 16 positively affect the student’s performance in Mech. 2, CE 311, CE 321, CE 322, CE 411, CE 412, CE 415 and CE 421. No analysis can be undertaken for Mechanical Engineering.

Conclusions

1. The average academic performance of the Engineering students (Civil, Electrical, Mechanical) in their basic mathematics courses are generally satisfactory.
2. There is a progressive improvement of the students’ academic performance from one basic to the next higher courses.
3. The basis Math courses are weak and some fail to enhance learning in the professional courses.
4. There is a need for more sufficient data for regression analysis in order to determine the significant predictors of academic achievement in Engineering degree programs.

Recommendations

1. School Administration should:
   a. Offer non-credit course in Algebra and Trigonometry for the Engineering Freshmen preferably during summer, before the start of the first semester;
   b. Conduct periodic seminar-workshop and demonstrations in the teaching of mathematics and recommend teachers for scholarship programs to undertake further studies in mathematics in recognized and accredited institutions;
   c. Implement a policy for all students to take a comprehensive examination qualifying them to enroll in professional courses, or a policy that all students should finish first all the general courses before enrolling in the professional courses.
   d. Endeavor a strictly-implemented policy on submission of grading sheets at least two days before enrollment starts.

2. Teachers should
   a. Provide for the strengthening of technical communication skills in order that the students will be trained to prepare, interpret and transmit technical information acquired and required for the program
   b. There should be coordination between teacher of the previous Math course with the in-coming one in order that the former can acquaint the latter with what had been covered and with the weaknesses of the students.
   c. Discuss first the relatedness of the professional courses with that of the basic Math courses in order that students will be enlightened as to what is being discussed. Furthermore, formulas should be derived first before giving examples.
   d. Teachers teaching mathematics should have close working relations with faculty members handling professional subjects so that math teachers will become aware of the requisite mathematical knowledge of each professional subject.
   e. Enrich their syllabi in order to cope up with the changing society.
3. Curriculum planners should see to it that Engineering curriculum should not be conventional, compartmentalized and static, they should provide general flexibility so the Engineering education’s responsibilities to the individuals, society and the Engineering profession can be effectively carried out.