

Quality Enhancement Plan

Mathematics Clinic & Technology in Teaching Mathematics

As a part of Grambling State University's effort to improve the mathematical skills and knowledge of students, the Quality Enhancement Plan has implemented *The Mathematics Clinic* and *Technology in Teaching Mathematics*. These programs are designed to improve student performance in Pre-Calculus I and Pre-Calculus II and will ultimately be phased into additional general education courses along with other novel curricular and instructional techniques. Both of these initiatives began in the fall of 2010.

The *Mathematics Clinic* is available specifically to students registered in Pre-calculus I (MATH147) but is open to all students enrolled in mathematics courses. The clinic is held on Mondays and Wednesdays from 10:00 a.m. until 4:14 p.m. in Carver Hall, Room 277 and is facilitated by members of the mathematics faculty. The time required for the clinic is taken from the regular office hours of faculty. The advantage of *The Mathematics Clinic* is that for two days per week, all day, there is a faculty member available at a specified place and time to assist students.

While student participation was lower than anticipated during the first semester, a strategic marketing plan has been adopted to encourage and increase student participation during the Spring 2011 semester. It includes Public Service Announcements (PSA's) on KGRM (Grambling's radio station), at sporting events on campus, and on the electronic information boards across campus. As well, e-mails have been sent to all students and faculty.

Although student attendance during the first semester was low, data show that, on average, those who participated performed better than those who did not. During the Fall 2010 Semester 17 Pre-calculus I students participated in *The Mathematics Clinic*. The average grade-point-average in MATH 147 for the students who participated was 2.41, while the average grade-point-average of all students registered in MATH147 was 2.14. The average grade-point-average of those MATH147 students who attended two or more Mathematics Clinic sessions was 3.33. See Table I below.

TABLE I

MATH147 PRE-CALCULUS I MATHEMATICS CLINIC PARTICIPATION & GPA (Fall 2010)

Average GPA of all Students enrolled in MATH147	2.14
Average GPA of Mathematics Clinic participants	2.41
Average GPA of participants who attended 2 or more Mathematics Clinic sessions	3.33

Data show a benefit to attending two or more sessions. During the pilot phase (Fall 2010-Spring 2011), students were strongly encouraged to attend *The Mathematics Clinic*, but not required. The Quality Enhancement Plan Mathematics Clinic will be implemented fully during the 2011-2012 Academic Year and will include measures to strongly motivate more student participation.

Also during the Fall 2010 semester, *Technology in Teaching Mathematics* was implemented into twelve of the sixteen sections of MATH147 Pre-Calculus I offered. Specifically, the mathematical software and book bundle, *Hawkes Learning Systems* was adopted. The textbook includes a software package that supplements classroom instruction. Students are encouraged to solve additional problems at their own pace and at their own convenience. This involvement helps students enhance their conceptual and procedural knowledge skills. The package also provides unlimited homework problems with immediate error-specific feedback. Faculty members can also generate homework assignments, quizzes and tests and assess students' academic progress with the software.

An analysis of the data for the previous 14 semesters (Fall 2003-Spring 2010) shows and that an average of 45% of students earned a satisfactory grade (A,B,C) in Pre-Calculus I (shown in Table II) . During the first semester that Technology in Teaching Mathematics was offered in twelve sections and the Mathematics Clinic (available to all MATH147 students) was offered, 49% of students received a satisfactory grade (Table III).

TABLE II
PERFORMANCE IN MATH147 PRE-CALCULUS I (Fall 2003 - Spring 2010)

	<i>Total Number of Students</i>	<i># of Students with Satisfactory Grade</i>	<i># of Students with Unsatisfactory Grade</i>	<i>Percent Satisfactory Grade</i>
Fall 2003	128	13	115	10%
Spring 2004	98	10	88	10%
Fall 2004	161	25	136	16%
Spring 2005	113	41	72	36%
Fall 2005	182	77	105	42%
Spring 2006	89	55	34	62%
Fall 2006	142	53	89	37%
Spring 2007	82	52	30	63%
Fall 2007	126	80	46	63%
Spring 2008	76	59	17	78%
Fall 2008	481	317	164	66%
Spring 2009	320	155	165	48%
Fall 2009	580	291	289	50%
Spring 2010	289	163	272	56%
14 Semester Average	220	99	114	45%

TABLE III
PERFORMANCE IN QEP MATH147 PRE-CALCULUS I (Fall 2010)

	<i>Total Number of Students</i>	<i># of Students with Satisfactory Grade</i>	<i># of Students with Unsatisfactory Grade</i>	<i>Percent Satisfactory Grade</i>
Fall 2010	585	289	296	49%

In conclusion, implementing Quality Enhancement Plan initiatives, the Mathematics Clinic and Technology in Teaching Mathematics, to improve the mathematical skills and knowledge of students has increased student success in Pre-Calculus I.