

# LSU Math Professor *Delivers* for LA High Schools



Above: Students from Broadmoor High visited the Laser Interferometer Gravitational Wave Observatory (LIGO) in Livingston Parish and learned how math and science are connected.

Center: LSU student Ashleigh Cullen works with Capitol Middle sixth graders during the after school tutoring program.

Far Left: Broadmoor High School's GK-12 team: front, left to right, math teacher Linda Raush and LSU student Amanda Choppin; back, left to right, physics teacher Steve Griffin and LSU graduate student Karim Elkholy.

Left: The GK-12 team at Baker High includes (left to right) Aubrey Turner, Jim Carroll, Karen Bergeron, Jeremy Aikin, and Kevin Zito.

As we reported in the fall 2005 issue of *Kaleidoscope*, the LSU Department of Mathematics has embarked upon an innovative and comprehensive program to improve mathematics instruction in Louisiana's public schools. One core piece of this effort is the department's participation in LSU's GK-12 program, as it is known, a joint effort of the LSU Colleges of Arts and Sciences, Basic Sciences, and Engineering, and LSU's Office of Strategic Initiatives. Funded by a \$1.58 million grant from the National Science Foundation, this comprehensive program encompasses a variety of education, research, and outreach activities in Louisiana public schools.

The schools in the program include East Iberville Parish Elementary and High School, Baker High, and, in Baton Rouge, Istrouma, Bellaire, Broadmoor, Glen Oaks, and Tara High Schools, and Kenilworth and Capitol Middle Schools. The project's principal investigator, Demarcus D. Smith Alumni Professor Frank Neubrandner, reports that the program, which was launched in fall 2005, has already had an impact in several of the schools. Neubrandner, his colleagues,

teachers in the schools, and LSU students recently cited a number of significant effects on three schools.

The experiences recorded at Baker High, Broadmoor High, and Capitol Middle represent the work throughout the larger program and indicate the high level of dedication and cooperation among the teachers, the LSU students and faculty, and the middle and high school students themselves. Their stories in words and photos follow:

## **Baker High School**

In an effort to improve the student success rate on the Louisiana Graduation Exit Examination and to increase student enrollment in advanced math classes, LSU and Baker High have implemented elements of the GK-12 program at the school. LSU graduate and undergraduate students work at Baker High School to run math labs, increase after-school tutoring, and work with teachers in the classrooms. Baker High School is notorious for having one of the lowest passing percentages in the state on the math portion of the exit exam, and the math labs are geared toward helping

those students who struggle with the exam. “The program has greatly improved our ability to meet the needs of our math students,” says Jim Carroll, a math teacher and the program coordinator at Baker High School.

Though this is the first year the program has been in place at Baker High School, it has already been very successful. Graduate student Jeremy Aikin has been working with Karen Bergeron, a math teacher, to implement innovative ways of presenting some of the more challenging topics students cover in Algebra 2. Bergeron has found that this collaboration has expanded her professional horizons, saying, “Working with a graduate student has given me more confidence to teach a broader range of topics in math.” Team members feel that, as teachers become more comfortable in their roles as teachers, students will become more comfortable and confident in their roles as learners.

“It’s a win-win situation,” says Aikin. “Graduate students and undergraduates gain valuable experience, while at the same time the high school students have more opportunity for one-on-one help.” This is exactly what the students are getting in the math labs, and it seems to be paying off. Mai Nguyen, an undergraduate running one of the math labs, expresses the sentiment of everyone involved when she says “I get a great feeling of accomplishment when I hear that one of my students finally passes the exit exam.”

The administrators, teachers, and college students involved see more in the future of the program than just an increase in the number of students who pass exit exams. They hope to provide more advanced placement classes with greater student enrollment. Additionally they envision having math classes integrated with science classes in which lessons can be applied in science shortly after they are learned in math. The team members believe these dreams may all become reality with the help of GK-12.

### **Broadmoor High School**

The team at Broadmoor High includes two LSU students: Karim Elkholy, a Ph.D. candidate in mechanical engineering, and Amanda Choppin, an undergraduate in math. They work with Broadmoor faculty members Linda Rausch, a National Board certified math teacher, and Steve Griffin, who teaches physics. The goals of the team are to improve scores on the exit exam and the ACT and also to increase the number of students in advanced placement courses.

Elkholy works with Griffin to help students in physics see the connections between the science and math. The team recently accompanied their students on a field trip to Livingston Parish for a tour of the Laser

Interferometer Gravitational wave Observatory (LIGO). While there, the students witnessed firsthand the interconnectedness of many different disciplines.

Elkholy is excited about the progress the team has made in the short time they have been working. “Besides preparing a manual, we’ve designed and implemented lab activities that incorporate inquiry and technology. We’ve also introduced higher level mathematics that reveal the relationships between calculus and physics,” Elkholy explains.

In addition to the classroom work, the team has also been working with students in the school’s new math lab, which has 32 new computers as well as calculators and probes for data collection and analysis. Choppin has been instrumental in the activities of the new lab, tutoring students and working with other student teachers to develop an efficient scheduling procedure.

### **Capitol Middle School**

LSU graduate student, Kevin Tubbs, and undergraduate student, Ashleigh Cullen, are enhancing math education at Capitol Middle School through participation in the GK-12 program. The LSU students are providing in- and after-school tutoring as well as enrichment classes, which include standardized test prep/practice. The students have also collaborated with various departments and organizations at LSU to provide activities and demonstrations that expose the students to the applications of mathematics in science and technology fields.

The GK-12 program has the support of the administration and faculty. Hazel Sept, GK-12 math teacher, says “Mr. Tubbs and Mrs. Cullen have been an incredible asset to both my classroom and the entire math department at Capitol Middle School.” Melisha Jenkins, sixth grade math teacher, says, “The LSU GK-12 students provide more than assistance and guidance in relating the mathematics we teach to applications in science and technology. They are excellent role models and bring new excitement and enthusiasm to the students.”

Administration, faculty and students are excited and look forward to continued participation in the GK-12 Program. Future projects include development of a new mathematics elective course and peer tutoring program. The proposed elective course aims to make use of the school’s existing video production lab to develop math tutoring video lessons for the school.

These examples of the successes of this innovative program illustrate one way the College of Arts and Sciences leads the way in community outreach and shares its talent and resources with the community.