

LSU Math Professor Delivers for Louisiana High Schools



LSU math major Verna Richards works with students at Baton Rouge High

Cain Center mentor teachers Linda Raush (Broadmoor High), Hazel Sept (Capitol Middle), and Jodi Baudry (Central High) discuss LSU's "Concentrations in Secondary Education."



Alumni Professor Frank Neubrander (top row, fourth from right) poses with a group of middle and high school teachers who attended one of the 2005 summer workshops.



Mathematics Professor Works to Improve Louisiana Secondary Education

The LSU Department of Mathematics has begun a comprehensive education outreach program to better prepare Louisiana high school students for math-intensive undergraduate programs. This program is the brainchild of Professor James Madden and Demarcus D. Smith Alumni Professor Frank Neubrander.

Neubrander, who has been with LSU since 1989, became involved out of concern for the low number of

LSU students entering the department's undergraduate degree program in mathematics—a trend that has been documented statewide, with only 470 mathematics majors among a total of 184,600 undergraduates in Louisiana's public colleges and universities in the 2003-2004 academic year. At the same time, Louisiana has a deficiency in the number of teachers who are certified to teach mathematics, particularly at the

middle and high school levels.

These problematic shortages are connected.

Neubrandner says, "Considering the low number of Louisiana students taking advanced math courses in high school and, as a result, the low number of high school students entering college with a strong background in mathematics, it is not surprising that all of the state's mathematics and math education departments suffer from insufficient enrollment in their undergraduate programs."

To address both problems, three years ago Madden and Neubrandner teamed up with LSU's Gordon A. Cain Center for Scientific, Technological, Engineering and Mathematical Literacy. Through this partnership, the Cain Center has developed from a small unit managing a few education-oriented projects into a well-funded, major education enterprise. The Cain Center currently manages or collaborates in over \$8 million in grant and contract funding for a variety of education, research, and outreach programs, and maintains active partnerships with Southern University (SU), the Southeastern Louisiana University (SLU) and the Louisiana Resource Center for Educators (LRCE), as well as with many crucial governmental agencies and school systems.

In 2002, Madden and Neubrandner teamed with faculty at SLU and several schools in south Louisiana to begin an innovative program for tutoring and teaching mathematics. The initial program established mathematics laboratories at the target schools that included computers with educational software and university students to work as volunteer tutors. University faculty also conducted summer seminars at LSU for mathematics teachers from the schools.

One element that Neubrandner credits for the early successes of the fledgling program is the size and energy of the LSU Department of Mathematics, which is the second largest department at LSU and has one of the largest mathematical research units in the South. The department has about 70 faculty members, 51 of whom are professorial rank, and over 90 graduate students. The department has recently added material science and mathematics education groups and has upgraded both its undergraduate and graduate programs.

The results of the combined efforts of the mathematics department are proven: the number of undergraduates in the mathematics program increased from 80 in 2002 to 185 in 2005. "We are on track, but we still have a long way to go," Neubrandner says. Also helping to generate higher enrollment in the undergraduate mathematics program is the requirement of LSU's new secondary education program that all future teachers

major in a content area. Over 25 percent of the Department of Mathematics' undergraduates participate in the new concentration in secondary education. These students will receive not only a regular bachelor of science degree in mathematics but also secondary teaching certification as well.

Recently Neubrandner and others at LSU received a \$1.5 million, three-year (2005 to 2008) grant from the National Science Foundation to support math and science education in East Baton Rouge Parish and the surrounding school districts. This project places nine advanced LSU graduate students with math and science teachers in area middle and high schools. Each student works with two teachers for a minimum of ten hours per week to provide year-long support. Then, during the summer, the teachers attend workshops at LSU for professional development.

Additionally, this program provides each teacher team with an undergraduate student and funds to create and install its own math lab. These undergraduates work at least ten hours per week with their teams. The math labs have as their tasks to integrate tutoring into the schools' math classrooms and to integrate technology into tutoring. Specific targets for tutoring are remediation, enrichment programs for advanced students, and preparation for standardized tests and the ACT.

Besides providing funds for the math labs, the program also pays stipends to the teachers and to the graduate and undergraduate students. The project also provides funds for the teachers and graduate and undergraduate students to attend conferences, workshops, and meetings.

With the support of Louisiana Board of Regents Education Enhancement grants, the Cain Center, the SU Department of Mathematics, and LRCE, Neubrandner is presently forging a statewide consortium of mathematics faculty and educators to support the implementation of the state's new high school curricula and to help facilitation of a rigorous four-year mathematics course sequence ending with AP calculus or AP statistics at all Louisiana high schools.

Neubrandner says the interdisciplinary Cain Center "is a wonderful unit that allows me to contribute to the design of programs that strengthen the links between higher education and local school systems, so that all Louisiana children can receive a science, technology, engineering, and mathematics education that will prepare them for success in college and beyond." Look for more information on the role the Cain Center and Frank Neubrandner play in secondary education in south Louisiana in our next issue of *Kaleidoscope*.