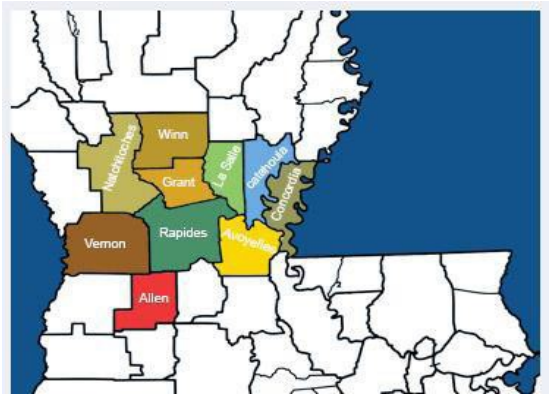
School Redesign Request for Information

The Cain Center's primary mission is to support high-quality STEM education and College Readiness initiatives through programs and services that build capacity for successful teaching and student learning. The Center is renowned for high-quality STEM professional development offerings (Math-Science Partnerships, LaSIP, AP Training, etc.) and for its leadership role in curriculum development and implementation support programs (e.g. Eureka Math in collaboration with Great Minds Inc. and the new engineering, digital media & arts, and coding curricula created in collaboration with Lee High School). However, the Cain Center also offers a wide variety of tested, customizable programs that were designed specifically to aid school systems, including those in rural Louisiana, in comprehensive school improvement. These are:

(I) The Louisiana Academic Residency for Teachers,
(II) The Louisiana Math and Science Teacher Institute,
(III) The LSU College Readiness and Dual Enrollment Program.

Before describing these programs in more detail, we emphasize that the Cain Center has access to a large support network of highly trained STEM teachers that allows us to customize programs to fit local needs while serving many schools and/or school systems at the same time.

(I) The Louisiana Academic Residency for Teachers: Persistently struggling schools and school systems often find it difficult to recruit and retain high quality teachers. This is especially so in rural schools, since it is often extremely difficult to convince new, highly qualified teachers to move to remote parishes and/or struggle with long daily commutes. However, without a stable, high-quality teaching staff, any school improvement model is doomed to failure. In 2009, in response to this pressing human resource issue, the Cain Center created the *Central Louisiana Academic Residency for Teachers (CART)*. Between 2010 and 2015, in collaboration with the Rapides Foundation, the LSU School of Education, and nine school districts in Central Louisiana, CART recruited, trained, placed, and supported 51 new STEM high school teachers[1] for the Central Louisiana region, with a retention rate of over 83% (as of November 2016). Unique to CART was the systematic attempt to recruit local residents with a bachelor's degree and train them to become high-school STEM teachers. This local recruiting strategy ensures that most residents have stable connections in the rural communities where they will be teaching and that they will stay in their communities for years to come – in spite of the attractions of more affluent school districts a hundred miles away.



It is so much easier to turn rural residents into teachers than trying to turn teachers into rural residents!

[1] 25 Math, 22 Biology, 5 Chemistry, 1 Physics

The Louisiana Academic Residency for Teachers is a tested, customizable, and scalable graduate degree program housed in the LSU College of Science. There are several financial models available to districts to support the training of their own, home-grown teaching staff.[2] In one of the most widely used options, school systems support first-year teachers through graduate assistantships plus tuition payments while they are working on their LSU graduate degrees. This model increases the quality of instruction at zero marginal cost to districts, making it equally accessible to both high- and low-income districts. The district pays the cost of an LSU graduate assistantship plus tuition for a resident, and the resident discharges his/her teaching duties in district classrooms instead at LSU. Academically, the program has intensive residential face-to-face content components at LSU during the summers and online and/or evening components during the academic year to accommodate teacher schedules and far-away residency locations. It is built around three major pieces. First and foremost, a one-year teaching residency in one of the participating school districts. Second, enrollment in one of LSU's specially designed professional graduate programs in the LSU College of Science, leading to an 18-credit-hour graduate certificate or an 36-credit-hour *Master of Natural Sciences* [3]degree, depending on the underlying financial and logistic model. Third, since the participants have in general no prior teacher education exposure, an alternative certification program goes hand-in-hand with the residency at the schools. Since the core elements of the program (graduate degree programs and residency elements) are programmatically in a stable and replicable form[4], all three program elements can be adjusted to fit school district needs and financial/logistic parameters.

(II) The Louisiana Math and Science Institute (LaMSTI): This is a 27-month professional graduate program supported by the LSU College of Science as a special track of the *Masters of Natural Sciences* framework that supports the CART program. Experienced secondary math and science teacher-leaders learn, communicate and improve the knowledge base essential to teaching mathematics and science and to mentoring beginning teachers at their schools. The course of study focuses on fundamental pedagogical, mathematical and scientific concepts and their place in the secondary curriculum, in order to equip teachers to provide high-quality instruction for all learners and with essential leadership and mentor skills. The LaMSTI curriculum is aligned with the curriculum standards and benchmarks adopted by Louisiana, with the LSU College Readiness and Dual Enrollment Program, and with College Board expectations for Advanced Placement. To

[2] Options include state-supported tuition subsidies as described at http://www.regents.la.gov/page/ctep-classroom-teacher-enrollment-program; or support generated from the LSU Cain Center College Readiness Program;

[3] ***The Masters of Natural Sciences:*** Recognizing the vital connections between top-caliber teachers and student interest, achievement, and retention, it is imperative to focus on improving the quality of STEM teachers through content-rich training and/or professional development. Offered by the LSU College of Science, this professional master's degree program includes graduate course work designed to strengthen teachers' knowledge and command of their subject matter and curriculum (factors that have been proven to increase student achievement), as well as preparation for service as lead teachers, mentors, and/or coaches. Since 2010, the MNS program has graduated over 150 STEM teachers and was supported by a $5M Math and Science Partnership Institute grant from the National Science Foundation and a $14M U.S. Department of Education TQP grant.

[4] The LSU College of Science created a new Associate Dean position to oversee and coordinate all STEM teacher education programs in the College. Four new graduate-level math courses were created and are now listed in the LSU Catalog. Twenty-two graduate-level LSU courses (20 of which are in the College of Science) were created or modified and adapted to serve the program. Faculty capacity to teach courses for teachers has been enhanced and a new Graduate Certificate in Mathematics for Advanced Secondary Instruction was implemented.

accommodate all types of funding models and logistic restrictions, the degree program is also highly customizable to fit teacher and district needs.

(III) The LSU College Readiness and Dual Enrollment Program: In 2016-17, this self-sustaining, not-for-profit program coordinated by the Cain Center will offer 39 partnering high schools access to university-based, pre-college and college-level courses in Art, Biology, Chemistry, Computer Science, Engineering, English, Environmental Science, French, Geography, German, History, Kinesiology, Mathematics, and Spanish, as well as ACT and CLEP preparation courses. Included in the CRP offerings are 45 dual enrollment courses that pair with regular high school courses, high-school honors courses, and high-school AP courses. In the 2016-17 academic year, over 3,300 high school students will be enrolled in LSU DE courses, with at least another 6,000 taking the same courses (including homework and assessments) for high school credit only. These students take the LSU DE courses for no charge in order to be "college ready" when they officially enroll in the course after matriculation. High school teachers are a vital part of the LSU CRP. They work closely with the LSU faculty member who serves as the Instructor of Record of the course, provides extensive training for the teachers, and supervises the delivery of the content, the assessment, and the overall facilitation of the courses at the high schools. Often, the facilitating high school teachers receive additional graduate level training through professional graduate degree programs for teachers like the Masters of Natural Sciences (MNS) program. As of the summer of 2016, approximately 225 high school teachers have been certified by LSU to facilitate its DE courses. The CRP program also has pre-college and/or project-based non-DE courses available to participating high schools. Non-DE teachers are offered the opportunity to attend the same workshops as the DE teachers or other, more appropriate training programs. These professional development opportunities are available at no charge for all other high school faculty at schools participating in dual enrollment within the LSU College Readiness and Dual Enrollment Program.

Evidence of Track Record of Student and School Outcomes: Upon request, we are happy to share the data available to us concerning student and school outcomes, in a form compatible with applicable privacy laws.

Your Organization's Model: All Cain Center programs are designed to be scalable and highly customizable. They can be made available to all interested Louisiana school districts and can be included in a wide variety of partnerships with other private or public providers. Upon request, we are happy to provide you with a description of our 15-year experience working with other third party providers to support school and district improvement. Clearly, the programs (I), (II), and (III) described above cannot work if they do not have the full administrative support of the participating school partners. Certainly, logistic support by the state would help in many respects, such as assessment and evaluation data, certification issues, etc.