Five-Year Strategic Plan: 2010-2015

Engineering is intertwined with our very own way of life.

Engineering is dedicated to the process of creating. Engineers solve society’s problems, make ideas reality and generate prosperity that improves the quality of life. Almost every innovation in our lives is the direct work of an engineer—roads, cars, buildings, appliances, computers, communication devices, tools and the list goes on.

Here in Louisiana, engineering is critical to our current economy and environment. It is vital to sustaining and improving both the natural infrastructure and that which we have built, and it is a key component to enhancing and diversifying our energy sources.
Dear Stakeholder,

Thank you for your interest in the Louisiana State University College of Engineering. I came to LSU in 2009 and was excited to discover the engineering and construction management gem we have located within this university, and the incredible potential ready to be unleashed.

Quietly, over the last century, this college has produced some of the nation’s premier engineers who have gone on to do tremendous work at both local firms and some of the world’s largest companies. In fact, in our core disciplines, LSU is considered one of the top engineering colleges in the country. While our reputation among the companies that hire our graduates is stellar, 2010 marks the year we raise the bar. Through an intense process that involved our engineering faculty, students, alumni, and key stakeholders, the strategic planning council has developed an in-depth, five-year strategic plan to not only enhance our already high-quality program, but also share with our state, the country and the world the unique value of an LSU Engineer. This plan supports congruent goals and drivers in conjunction with LSU’s Flagship Agenda 2020, improving research and educational enterprise to bring LSU to a new level of excellence. In addition, the College of Engineering will be an example of how higher education can partner with industry, promote economic growth and create a better environment for the future.

Although our theme, “Improving Lives. Transforming Louisiana. Changing the World.” may sound ambitious, I am confident that it can be done. However, it will take a collaborative effort from our leadership team, our incredible faculty, and our talented students combined with the support of stakeholders like you. This plan is our next step in staking our claim as one of the nation’s premier engineering schools. We’re glad you’ve joined us.

Sincerely,

Richard Koubek
Dean, LSU College of Engineering

Bert S. Turner, Chair in Engineering
More American CEOs are Engineers.

Engineering, Economics and Business Administration were the three most common undergraduate degrees with Engineering at 22% followed by Economics with 16% and Business Administration with 13%.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Engineering</td>
<td>22%</td>
</tr>
<tr>
<td>Business Administration</td>
<td>13%</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>6%</td>
</tr>
<tr>
<td>Economics</td>
<td>16%</td>
</tr>
<tr>
<td>Accounting</td>
<td>9%</td>
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*Source: ROUTE TO THE TOP NOVEMBER 05, 2008* Research for the 14th annual Route to the Top was prepared by Meghan Felicelli, Spencer Stuart, Chicago, Illinois. Research and trend comparisons are based on the S&P 500 ranking as of April 18, 2008.
Our Mission
The primary mission of the College is to impart knowledge and learning skills to its students while also creating new knowledge and seeking innovative ways to improve people’s lives.

Vision 2015
Our vision is to harness and enhance the College of Engineering’s resources. In doing so, we will continuously transform the lives of the citizens of our state, the nation and the world through: research and innovation, instruction and learning, and outreach and engagement. We seek to establish the College as a critical asset for Louisiana citizens, industry and government.

...we will continuously transform the lives of the citizens of our state, the nation and the world...

The impact and effectiveness of the College’s efforts will be recognized by:

• Educating the next generation of engineers, researchers and educators to solve problems for the benefit of society and to meet its future needs
• Solving critical problems that affect and improve human lives through research and innovation
• Expanding and diversifying Louisiana’s economy through outreach and entrepreneurial activities

As the flagship engineering program representing the state, the LSU College of Engineering will be a national leader in the key areas of energy and environmental sustainability, and natural and built infrastructure.
The LSU Engineer

Today and Tomorrow

- A critical and holistic thinker and a life-long learner with an entrepreneurial spirit
- Skilled communicator, adept at teamwork and able to rally teams around him/her
- Great awareness of the national and global implications of issues such as the environment and sustainability—always remains engaged with the community and society
- Hands-on problem solver, possessing a strong work ethic and leadership qualities
- Well-grounded with sound technical knowledge and understanding

LSU’s College of Engineering offers students both rigorous coursework and challenging, hands-on experience. These educational opportunities are showcased in such unique features as:

- An on-campus oil well-control research and training facility
- Environmental research and field work regularly conducted in our nearby coastline and bayous
- A senior design project that teaches collaboration to reach a solution and then stresses teamwork to bring it to life

The result? Companies that employ our engineering graduates are continuously impressed. The LSU Engineer has a reputation as a hardworking individual and a solid team leader. Immersion in our unique south Louisiana culture affords our engineers and construction managers strong communication skills with both management and those in the field. Our graduates are never shy about stepping into the trenches and getting a little dirt on their hands. The LSU Engineer is a key asset to an employer’s team and a coveted hire. You’ll find them across the state and the nation working hard to improve lives and change the world.
Return on Investment

LSU's 2009 petroleum engineering graduates landed an average starting salary of $87,214 a year—$4,000 more than the average for best-paid petroleum engineering major in the U.S.

LSU Engineers
Reaping the Rewards

Students graduating from LSU’s College of Engineering receive starting salaries higher than the national average in five distinct degree fields:

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>LSU AVERAGE</th>
<th>NACE AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Engineering</td>
<td>$87,214</td>
<td>$83,121</td>
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<tr>
<td>Chemical Engineering</td>
<td>$68,526</td>
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<td>Mechanical Engineering</td>
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<tr>
<td>Electrical Engineering</td>
<td>$64,600</td>
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<tr>
<td>Civil Engineering</td>
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*According to the National Association of Colleges and Employers (NACE) Summer 2009 Salary Survey and LSU Career Services
Our Goals

The College of Engineering supports congruent goals and drivers in conjunction with LSU’s Flagship Agenda 2020, to improve research and educational enterprise to bring LSU to a new level of excellence. The overall goals of the College are broadly related to its three missions of Instruction/Learning, Research/Innovation and Outreach/Engagement. Effective creation and transfer of technical knowledge and imparting learning skills to the next generation of The LSU Engineer is our primary goal. Through research and innovation, we not only advance knowledge, but also enhance classroom instruction and the overall undergraduate/graduate education and learning mission. In addition, outreach activities serve the citizens of Louisiana through the College’s position as the state’s flagship engineering program.

Instruction/Learning Goals
Through our Instruction/Learning strategies we will strive to be recognized as a leader in both engineering and construction management education as well as for its excellence and innovations. We will impart students with life-long learning skills and develop engineering graduates known for their critical-thinking, holistic approach to problem solving, communication, teamwork, entrepreneurial spirit and leadership skills. Our students will be instilled with global awareness and enhanced international learning experience. All of our Instruction/Learning goals will be fostered by a supportive atmosphere that allows faculty and students to enjoy an educational and cultural experience that is meaningful and memorable.

Research/Innovation Goals
Our Research/Innovation goals will seek to establish excellence with national and international visibility in key areas of value to the state, nation and the world. Our team will build on existing strengths, while selectively adding complementary expertise in other areas to create a robust atmosphere of a collaborative, interdisciplinary research ecosystem that include energy, environment, and infrastructure. This network will blend fundamental research and technological innovation to address problems that are of specific importance to the economy and health of the state and/or have national and global impact.

Outreach/Engagement Goals
Through Outreach/Engagement, we will serve Louisiana as a primary engineering resource for education, research and economic development. We will solidify a positive image within Louisiana and nationally and globally as a valuable, proactive and strategic partner, while expanding the exposure of engineering principles and applications to Louisiana children for the promotion of science, technology, engineering and math (STEM) skills. In addition, we will increase, promote and embrace sustainable diversity within the College for students, faculty and staff.
We live in a dynamic, rapidly changing world. We need people trained to not only proactively meet society’s current demands, but also provide solutions for problems that are yet to manifest.

**Strategy 1**

**Preparing LSU Engineers for a Dynamic World**

**Strategic Actions**

Imbue critical-thinking skills and holistic approaches to problem solving in multi-disciplinary classes during the freshman/sophomore years, including core knowledge courses spanning disciplines. Then, cohere these skills with multi-disciplinary teamwork and communication skills through a program of capstone design projects.

Impart life-long self-learning skills through teaching approaches that utilize fundamental concepts and technology to solve problems and learn advanced material. Develop flexibility in curricula to address concentrations and minors in new areas including interdisciplinary sectors of topical interest.

Create and implement best practices in engineering education that recognize the changing background of students to improve retention and graduation rates.
Implement a sustainable program of faculty development and training of graduate teaching assistants, which will promote the discovery and promulgation of novel and successful teaching/learning initiatives as well as the use of best teaching/learning practices.

Encourage leadership, ethical practices and entrepreneurial qualities in students through mentoring, exposure through engineering professional society activities, participation in local and national competitions and other opportunities.

Impart global awareness and integrate environmental and sustainability concepts throughout the curriculum with a goal of minimizing adverse impacts through the use of engineering practices.

Emphasize our ability to make a global impact by exploring and fostering engineering discoveries that can be applied to meet worldwide solutions.

Provide increased research experiences to advanced undergraduate students.

Develop an Engineering Campus at LSU that will provide access to state-of-the-art instructional infrastructure support through the remodeling of Patrick F. Taylor Hall and construction of a new Chemical Engineering building.

Enhance the overall student learning experience through flexible laboratories and classrooms, state-of-the-art equipment, and staff versed in innovative academic approaches to engineering education.

Expand the College’s impact within the state and beyond through distance learning and other innovative, effective approaches.

Enhance linkages and collaborations with industry, consultants, and public agencies as a means to develop practice-oriented educational experiences for students.
Strategy 2
Conducting Research to Improve Quality of Life

Use-inspired research and the development of intellectual property can not only improve the quality of life for people on a global scale, but can also make an impact on our state and university. We must become more entrepreneurial to develop solutions that lead to improved quality of life and economic development. Our geographic location provides a natural environment for research. We must take advantage of the fact that “we live in the laboratory.”

Strategic Actions

Utilize existing expertise in the College to address the following two strategic, broad, interdisciplinary thrust areas, which will have significant impact in the state and beyond:

• **Energy and Sustainable Environment**—Seek low-cost, clean, traditional and alternative energy sources for transportation and power generation including alternative fuels and their efficient combustion; employ new technology to enhance production and the efficient utilization of petroleum fuels; seek out materials and technology for compact and alternative power sources; and search for efficient power transmission and distribution. All of these efforts will be pursued with a focus on maintaining a clean and sustainable environment.

• **Engineered and Natural Infrastructure**—Enhance coastal infrastructure to sustain environmental impacts; improve energy and industrial infrastructure; and develop coastal habitat and environmental infrastructure. Additional focus should center on the sustainability and interplay of the natural and built environment along with state-of-the-art monitoring systems.

Utilize and enhance expertise in Materials and Nano-Micro-Wafer Scale Systems to provide an integral, inter-disciplinary research and infrastructure support for the above two thrust areas.

Promote development of individual and interdisciplinary research areas of emerging importance to the state and the nation.

Leverage high-performance computing resources for research in various fields and for extending technology in high-performance computing.

Enhance the quality of research programs in the College by identifying and aggressively recruiting key faculty members.

Enhance the effectiveness of the Engineering Campus through remodeling and distribution of research space in a flexible manner.

Develop research infrastructure and create an ecosystem that not only attracts and retains top-notch research faculty and graduate students, but also facilitates the establishment of national engineering research centers.

Research Ranking

LSU brought in over $31.4 million in engineering research during 2007-2008 and ranking us 49th in the country out of 350 in engineering research expenditures, placing us in the top 15%.

Source: The LSU System Office and NSF data
Strategy 3
Student Recruitment and Diversity

Fostering a culture of diversity adds more points of view, yields a more diverse workforce and ultimately increases the overall strength of our College.

Strategic Actions

Proactively engage with academic partners both in Louisiana and elsewhere to establish an active recruiting pipeline of high-quality students. Emphasize the recruiting efforts in middle schools to identify, encourage and guide potential up-and-coming students to the engineering profession.

Create a direct and transparent transition path to the College for students coming from community colleges and other institutions.

Recruit outstanding undergraduate students from within the College to the graduate program through a joint BS/MS program.

Identify and coordinate relationships with partner universities overseas for the exchange of faculty members, students and joint programs to enhance diversity, multi-culture exposure and the recruiting of superior students for graduate school. Establish a good rapport with feeder schools in other countries to attract outstanding undergraduate and graduate students.

Increase diversity in recruitment at all levels. Develop strategies to attract underrepresented students and faculty populations to the College. Enhance the learning experience by exposure to other cultures through increased global diversity.

Louisiana Needs Engineers

The Louisiana Workforce Commission predicts the state will need 1,090 new engineers and construction managers per year, which is more than the combined graduates from all of the state’s engineering colleges in 2009. We have an opportunity to fill this need.
Strategy 4
Improving and Diversifying Louisiana’s Economy

Creating a vibrant, innovative, research-based College filled with a talent-rich pool of LSU Engineers is key to generating creative ideas and becoming an attractive partner to companies across the globe. Innovation through academia and the business world will spawn a rich environment for companies and businesses to grow locally, paving the way for further diversification of our state’s economy.

Strategic Actions
Establish an atmosphere for entrepreneurial activities that result in start-up enterprises with a focus in emerging technologies.

To positively impact the lives of Louisiana citizens, utilize the College’s expertise in water, energy, materials, transportation, construction, oil and gas, petrochemicals, hurricanes, the environment and more to better engage with local needs through industry, government and private groups.

Partner with the Louisiana’s economic development team and others to diversify the state’s economic base. Diversification will be accomplished by promoting an ecosystem for innovation and technology transfer that will develop and foster university/industry partnerships in targeted areas for job creation.

Recognize and encourage all engagement efforts made by our faculty members for the benefit of the stakeholders and the College. Support outreach by faculty members for increasing College collaboration with industry.

Partnering with Louisiana Economic Development

Serve as a center of excellence, collaborating to bring in new companies to the State.

Provide technical expertise to make Louisiana companies more competitive.

Supply opportunities for LSU faculty and students to start new companies.

Mechanical engineering senior design team with their mobile deer stand and Chancellor Mike Martin in the Rotunda of the Louisiana State Capitol.
Strategy 5
Enhancing Retention - Making the College a Friendly Learning Environment

For a student, engineering is a challenging area of study. It is important to build a welcoming community of immersion that will offer support and help budding engineers form close-knit bonds with other students to ease their transition through the early freshman/sophomore years.

Strategic Actions

Create a friendly atmosphere for students, faculty and staff, which allows working and learning experiences in the College to be meaningful and memorable.

Coordinate all student-oriented services and communications to efficiently utilize students’ time through proactive and sensitive actions by faculty and staff.

Offer enhanced Residential College and off-class experiences to develop a sense of community through periodically organized activities by student professional societies and other groups.

Enhance student advising and mentoring experience, and the quality of on- and off-class contact time with faculty members.

Provide convenient, flexible and safe places for students to gather and study combined with proper tutorial assistance particularly in beginning engineering courses.

Offer an open and friendly channel of communication for students to provide their input and recommendations to the College. Provide proper and quick action to address legitimate concerns.

Provide easy and plentiful access to technology and technical software important to today’s engineers.
Strategy 6
Improving the College’s Visibility – Locally, Nationally and Globally

Louisiana is a state steeped in engineering and construction management. The flagship university produces talented, highly recruited engineering graduates who thrive in the workforce. Global companies look at us to meet many of their employee needs. It is important our communication efforts equal the quality of our students and convey these facts to our stakeholders in order to grow and fulfill our mission.

Our Goals Include
Focus communication to College stakeholders regarding opportunities offered by the College and its units. Stakeholders include alumni, friends, industries, appropriate government offices, academic partners and colleagues.

Enhance, standardize and upgrade department and College communications (print, web, face-to-face, etc.) to effectively project the College’s brand and image, and disseminate its activities, achievements and opportunities.

Create a culture of faculty recognition through the pursuit of prestigious awards in engineering societies and other important awards that recognize professional activities, as well as in the election to membership in national committees and academies.
Strategy 7
Developing Diverse Streams of Support
Our College possesses the talent, skills and leadership to undertake unique opportunities that are often presented. We must diversify funding sources for establishing a pool of working capital so that we can be flexible and nimble enough to respond to the many opportunities that arise.

Strategic Actions
Position the College as a strategic partner in economic development for the State of Louisiana.

Engage alumni, industry partners, foundations and government entities to enhance external, private funding.

Increase direct grant funding opportunities through collaborative and innovative proposals.

Develop new revenue from distance-learning and engineering extension opportunities.

Engineers are IN Demand
Of LSU’s 4,199 on-campus employer interviews conducted, 63% were for College of Engineering graduates (2646).

Source: LSU Career Services Interviews (Fall 08/Spring 09)
Strategy 8

Provide an Environment in Effective Decision Making

Leading engineering institutions thrive in creating special environments that foster this strategy. In doing so, we will efficiently and expeditiously achieve our long-term goals.

Strategic Actions

Provide an agile and nimble decision making environment.

Promote flexible organizational models to respond to changing educational, research and outreach opportunities.

Empower the staff to continually improve the quality of service provided.
Each strategic task and goals will be monitored based on performance metrics established by teams selected by the Dean. Comprised of faculty, staff, students, alumni and friends of the College, these teams will periodically assess the progress and present status reports. Feedback will provide the Dean with on-going information and allow the opportunity to modify the steps, increase or decrease certain efforts and fine-tune specific strategies to optimize the outcome.

How to Evaluate Success?
Performance Metrics and Periodic Assessment of Progress