Louisiana State University
Cain Department of Chemical Engineering

Vision and Planning Document

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**DEPARTMENT OBJECTIVES, GOALS AND METRICS.**

1.1. **OBJECTIVES:**

The strategic plan for the Cain Department of Chemical Engineering has the following general objectives associated with our mission to be widely recognized as an outstanding program among the national and regional peer institutions in the LSU National Flagship Agenda. These goals are focused broadly on the people in the department, the education and research programs, and the infrastructure and resources necessary to attain the first two goals. We want to be recognized as a top 30 department in the chemical engineering national rankings. Institutional benchmarking will be done against our LSU Regional Flagship Peer institutions: Auburn University, University of Florida, Clemson University, Virginia Tech, University of South Carolina, University of Tennessee, University of Kentucky, Mississippi State University, University of Virginia, Texas A&M and University of Arkansas. Our specific goals, performance indicators and metrics are described below:

**DISCOVERY: GOALS, PERFORMANCE INDICATORS AND STRATEGIES:**

1.1 **IMPROVE DEPARTMENT RANKING:**

1.1.1. *INCREASE FACULTY SIZE TO 20 OR MORE IN FIVE YEARS:*

*Strategy:* The department will increase its faculty size gradually to 20 in 5 years through filling retired faculty lines with junior faculty (assistant or associate professor) and hiring Cain Chairs at the senior level. The current tenured/tenure-track faculty number is 18. In the near term, we have three more $2MM Cain Chair positions which need to be filled. Department Chair will consult with the Dean to explore the possibility of merging some components of other programs with our Department.

1.1.2. *INCREASE FACULTY RESEARCH DOLLARS TO $200K PER FACULTY PER YEAR:*

*Strategy:* The department research profile will be improved by increasing the research expenditure per faculty to $200K per year. This will be through increased proposal submissions by the faculty and targeted collaborations on large multidisciplinary proposals. As senior faculty takes on more service activities and teaching responsibilities, the junior faculty and senior Cain Chair hires will be relied on to improve the research productivity.

1.1.3. *INCREASE RESEARCH PUBLICATIONS AND CITATIONS PER FACULTY PER YEAR:*
**Strategy:** The national rankings of the department will depend mainly on the faculty research publications and citations of the work. The number of research publications should increase to 6 per faculty per year. The current citation per paper is a respectable 9 and will be maintained or improved in the next five years. The number of citations per faculty per year should increase from the current number of 30. Similarly, the national visibility of the department is also dependant on the number of national and international presentations made by the faculty at various meetings. Faculty will take part in active seminar exchanges with peer institutions to improve our visibility. Department chair will work with local AIChE (BR Chapter) to increase the number of AIChE fellows in the department.

1.1.4. **INCREASE FACULTY DIVERSITY:**

**Strategy:** The national visibility of a modern chemical engineering program also relies on a diverse faculty. The department currently has 1 female faculty member, 2 Hispanics and no African-American or other under-represented minority on its faculty. In the interest of representing the State adequately we will place emphasis on well qualified minority candidates for future hires.

1.1.5. **ASSURE FACULTY RETENTION:**

**Strategy:** Salaries will be raised in a targeted manner with proposals submitted to the Dean (if and when salary pools and policies allow for such proposals) that demonstrate salary inequities related to performance and peer institutions. Endowed faculty lines will be used to supplement salaries of the best faculty. Faculty retreats and individual meetings with the Chair will occur annually, and faculty will be regularly asked for feedback and input. The Chair in concert with an Award Committee will develop a comprehensive list of awards for which faculty are eligible, inside and outside of the University. During subsequent years this list will be used to nominate faculty and students for university, national and international awards. In subsequent years the award committee will develop a general plan for departmental publicity, focusing on outstanding achievements by faculty, including national awards and publications.

**LEARNING: GOALS, PERFORMANCE INDICATORS AND STRATEGIES:**

1.2. **IMPROVE THE GRADUATE PROGRAM AND RESEARCH FOCUS:**

1.2.1. **INCREASE THE GRADUATE STUDENT NUMBER AND QUALITY:**

**Strategy:** The graduate student number should be increased gradually to 75 in five years. The department graduate committee will enhance the selectivity in admissions of new students to improve the overall quality of the graduate students. This would include among other aspects increasing both the overall GRE (V+Q) and
the GPA of entering students. Emphasis will be placed by the graduate coordinator to improve the retention of graduate students during the first year of study here.

The graduate committee will be tasked with identifying strong regional programs and cultivate “pipelines” to attract their students. The department will invest in annual visits by graduate committee members to select schools for recruitment purposes. The department will also allow faculty to visit and publicize the department at AIChE graduate school fairs and other regional fairs. The graduate committee will produce a brochure to publicize our program and will develop documents and multimedia presentations that highlight the department’s research activities. These documents should lead to presentations to at least 15 undergraduate schools each year. Emphasis will be placed on recruiting female and minority students into the program to increase their representation to 20% by 2012. Increased emphasis will also be placed on recruiting quality graduate students from Latin America, Europe and Asian countries. Increased participation by all faculty members as individuals to develop one-on-one personal contacts with promising applicants as early as possible in the process will be encouraged.

1.2.2. *Increase the Number of Graduate Fellowships Available:*

*Strategy:* The department chair will work with the LSU Forever Capital Campaign Steering Committee to raise five or more new fellowships ($25K) through $500K LSU Foundation endowments. A start has been made in 2007 with the first $500K endowment from one of our alumni, Dr. William Brookshire. Coupled with the existing $600K endowment from the Cain Foundation, we have only two such fellowships available presently. Four or more such fellowships will be targeted in the next two years. The department will make use of the current five $3K supplements that the graduate school provides each year to recruit good students. The Department will provide additional stipend supplements to attract a finite number of higher quality students. Exceptional students can make up to $30K in fellowships. The Department Chair will propose to the Dean that existing vacant $100K professorships be awarded to faculty so that $5K proceeds from those can be used towards graduate fellowship enhancements for deserving candidates. The department will also nominate excellent U.S. nationals for the Clayton fellowships available through the College of Engineering.

1.2.3. *Re-focus Research Priorities:*

*Strategy:* The Department faculty will maintain its traditional focus on the research needs of the petrochemical and chemical industry that we serve. These include the following thematic areas: Process Systems and Control, Advanced Materials and Catalysis, Environmental, Biochemical, and Computational Modeling. We will also refocus the research activities around the common theme of Energy, Fuels and Sustainable Feedstocks to take advantage of the current initiatives on-going at LSU
and nationally. Faculty release time will be provided to co-ordinate large Research Center type proposals.

1.2.4. **Improve the number and placement of graduate students**:

**Strategy:** Increased emphasis will be placed on the placement of our graduate students in teaching and research positions in peer institutions and national research laboratories. The number of PhD students produced per FTE is currently 0.23 and will be improved to 0.4 in five years.

1.3. **Improve the undergraduate program and laboratory**:

1.3.1. **Identify and institute further curriculum improvement**:

**Strategy:** The Department has already revised the curriculum by including three concentration areas (Biochemical, Environmental and Materials) in addition to the traditional Process Control emphasis. Further changes including horizontal and vertical integration will be instituted based on faculty discussions. The Department will also consider an introductory chemical engineering course during the freshman year to fully engage and arouse the interest of the freshmen towards chemical engineering. We will also consider ways of improving the retention rate of students in the sophomore year.

1.3.2. **Facilitate program evaluations**:

**Strategy:** The Department will maintain the ABET accreditation by successfully implementing the ABET plan, focusing on continuous improvement, responding to criticisms, and engaging the faculty in implementing the overall ideas that originated from the faculty retreat in April 2007. The Undergraduate co-ordinator and the undergraduate committee will co-ordinate the faculty ABET efforts, the appropriate evaluations, and the report submission. The Department will also participate in Institutional Program Review efforts and improvements.

1.3.3. **Improve the undergraduate laboratories**:

**Strategy:** Alumni and the Industrial support will be used to maintain and improve the undergraduate laboratories and experiments in the Unit Operations laboratory. State-of-the-art process control modules will be implemented in the Unit Operations Laboratory.

1.3.4. **Undergraduate research, industry internships, service learning**:

**Strategy:** The undergraduate research courses will be publicized and made use of to involve more undergraduate students in research as a vehicle to draw them into
The Department will engage students in discovery learning, co-operative education with industry, and internships. Our goal will be to have at least 2 undergraduate students per faculty member in research, and 75-80% of students will have participated in co-op and intern placement by senior year. The Department will apply for at least one NSF REU in one of the key areas of research. The Department will assist students in finding international opportunities in chemical engineering education. Undergraduate students will be encouraged to participate in service-learning opportunities.

**OUTREACH: GOALS, PERFORMANCE INDICATORS AND STRATEGIES:**

1.4. **IMPROVE THE DEPARTMENT INFRASTRUCTURE:**

1.4.1. *ACTIVE PARTICIPATION IN THE LSU FOREVER CAPITAL CAMPAIGN:*

**Strategy:** The Department Chair will actively participate in the LSU Forever Capital Campaign to raise the private funds necessary to obtain the State funds for the new chemical engineering building. The Chair will interact with the alumni group comprising the Department Steering Committee (DSC) to carry out the campaign and will be actively involved in bimonthly meetings of the DSC and the College Steering Committee (CSC). Department will produce and distribute its annual newsletter each Fall and coordinate an Alumni Reunion each Fall or Spring semester. A dinner to honor the Scholarship/Fellowship donors and recipients will be organized each year.

1.4.2. *DEPARTMENT INDUSTRIAL ADVISORY COMMITTEE INPUT:*

**Strategy:** The Department Chair has re-constituted and held several meetings of the Industrial Advisory Committee (IAC). The committee input will be sought in all matters regarding the Department. Periodic annual meetings will be facilitated by the Chair to discuss these issues with the IAC.

1.4.3. *DISTANCE EDUCATION:*

**Strategy:** The Department has made significant investments in Undergraduate Laboratories and has built a new training facility. This facility will be used for enhancing the distance learning and training for chemical, petrochemical and related industry professionals in the State.

1.4.4. *ADVERTISE DEPARTMENT STRENGTHS:*

**Strategy:** Efforts will be made to communicate department strengths and capabilities to external entities (peer universities, industry, alumni, national organizations). Advertisement of faculty, student and staff achievements will be
improved. Annual newsletter, periodic e-mails and advertisements in national magazines will be promoted.