

Chemical Engineering at MSU in 2007

Strategic Plan

Mission

The mission of the Dave C. Swalm School of Chemical Engineering is to prepare highly competent graduates at the baccalaureate, masters, and doctoral level. The baccalaureate program will provide a broad-based educational experience that prepares graduates for careers in chemical engineering, related industries, and postgraduate programs in engineering, medicine, and law. All graduates will receive a broad education that will enable them to become leaders in industry, the profession, and the community in the State of Mississippi, the United States, and the world- at- large.

Vision

The Swalm School of Chemical Engineering will produce exceptional chemical engineering graduates who are nationally recognized for their technical knowledge, work ethic, and “hands-on” approach to chemical engineering. Nationally prominent areas of technical excellence will include environmental and biochemical engineering, materials science, transport phenomenon and thermodynamics, and energy engineering. All graduates will participate in a “work experience” prior to graduation that could include cooperative education, summer internships, or work in a research laboratory.

Guiding Principles

The undergraduate educational experience will be the top priority of the School.

Fostering positive faculty-student interactions is a cornerstone of the School.

The School will focus its research efforts in selected areas of excellence, and will not try to represent all areas of chemical engineering equally.

The curriculum will be structured to maintain a strong “work-experience” oriented educational program.

The School will develop and maintain world-class teaching and research facilities, including the acquisition and maintenance of state-of-the-art laboratory equipment.

Institutional Benchmarking

Peer Comparison Group: Clemson University [Public, Land Grant]; Washington State University [Public, Land Grant]; Auburn University [Public, Land Grant]

Emulate Group: North Carolina State University [Public, Land Grant]; University of Florida [Public, Comprehensive]; University of South Carolina [Public, Comprehensive]; Georgia Tech [Public, Focused E&S]

Major Goal

Be comprehensively recognized as one of the top 50 Chemical Engineering programs nationally by 2007.

Sub goals

Faculty, Staff Development

1. Increase the number of endowed professorships/chairs from 3 to 7 by 2007.
 - a. Establish an endowed professorship/chair in each of the identified areas of technical excellence: environmental and biochemical engineering, materials science, transport phenomenon and thermodynamics, and energy engineering.
2. Increase the number of faculty recognized by the grade of Fellow to 3 by 2007.
3. Increase the number of full-time faculty members from 11 to 14 by 2007.
 - a. Establish Research Faculty Positions in each of the identified areas of technical excellence: environmental and biochemical engineering, materials science, transport phenomenon and thermodynamics, and energy engineering.
 - b. Add a full time Lecturer position to the department to assist with teaching. In support of this, provide an endowment of \$1M to provide sustainable salary funds.
 - c. Secure an additional tenure-track faculty line from the university administration.
 - d. Establish a \$1.5M (payout of \$75K annually) endowed “industrial practitioner” chair that would be held by a person with significant industrial experience to assist with instruction in the laboratories and process and plant design.
4. Increase the number of peer-reviewed journal publications per faculty member from an average of 2 to an average of 3 per year.

5. Have an average citation rate of 2 citations per paper published of all papers published by MSU chemical engineering faculty for the 4-year period previous to the evaluation year.
6. In any faculty searches, use available resources to generate a list of women and underrepresented minority doctoral candidates and contact them about the opportunities at Mississippi State in an attempt to ensure a diverse applicant pool.
7. Establish a Faculty-In-Industry summer internship program with key chemical industries. Provide a stipend from departmental funds that will assist faculty in maintaining two households and to pay miscellaneous expenses.

Facilities

8. Secure external funds for the support of laboratory and research equipment acquisition and maintenance.
 - a. Establish a \$1.0M endowment (payout of \$50K annually) to provide discretionary funds for equipment purchase, repair, and maintenance.
 - b. Secure \$1M in external funds from industrial and governmental sources to establish and maintain a world-class teaching laboratory.

Undergraduate Program

9. Maintain the current size of the undergraduate program to produce 45 graduates per year by 2007, but work to change demographics and quality of the incoming students.
 - a. Increase the average entering ACT score of chemical engineering students from a 27 to a 29.
 - b. Establish and fund a chemical engineering high school summer experience/research program to attract high caliber students to MSU. Targeted funding is \$10K per year to initiate the program.
 - c. Establish close relationships with the top high schools and community colleges in the state to include visits made by faculty and previous graduates for recruitment.
 - d. Increase the size of our scholarship program to include additional scholarship aid to high performing/high potential high school students.
 - e. Establish a scholarship fund for students scoring in the middle range ACT scores (23-27) who might otherwise not receive scholarship aid.
 - f. Increase the percentage of underrepresented minority students in chemical engineering from 15% to 20%. Working with the College of Engineering Dean's office, establish a recruiting program to target minority students potentially interested in Chemical Engineering in order to meet this goal.
 - g. Establish a 3-2 program with regional Historically Black Colleges and Universities in Chemical Engineering.

- h. Increase the percentage of women students majoring in chemical engineering from 40 % to 50%.
- i. Increase the number of companies and governmental laboratories with Chemical Engineering Cooperative Education programs in Mississippi (from X to Y), the Southeast (from A to B), and national (from C to D).
- j. Increase the number of companies and governmental laboratories with formalized summer internship programs with MSU students to 25.
- k. Establish an endowment of \$250,000 to support summer research positions within the School.
- l. Establish a formal relationship with the Mississippi School for Mathematics and Science in Columbus, MS.
- m. Ensure that students are exposed to frontier areas of chemical engineering within the curriculum including biotechnology, environmental engineering, materials science, energy related sciences, and nanotechnology.
- n. Apply for and receive an NSF Research Experiences for Undergraduates (REU) Award for one or more of the key focus areas.

Graduate Program

10. Increase the total number of graduate students from 25 to 50, with 60 % in the doctoral program and 40% in the Master of Science program.

- a. Establish an endowment of \$1M (payout of \$50K annually) to provide comprehensive and supplemental fellowships to attract the best and brightest students to graduate studies at MSU.
- b. Establish closer relationships with other Chemical Engineering programs in the southeast.
- c. Develop effective electronic and paper graduate recruiting materials.
- d. Provide first-class office and workspace for graduate students, including a computer at every desk, a comfortable study lounge, and study space.
- e. Establish a recruiting weekend to bring the most interested potential graduate students onto the MSU campus.
- f. Establish an M.S. Industrial Residency degree program similar to that at Clemson University.
- g. Encourage graduate student and prospective undergraduate student applications to fellowship programs.

11. Increase the total R&D expenditures for the School to be ranked in the top 50 (est. \$3.25 M annually) by 2007.

- a. Expand the scope and capabilities of the E-Tech Laboratory to take advantage of new federal and state biotechnology initiatives.
- b. Establish the second floor area as a focal point/gathering place for bioprocess engineering at Mississippi State.
- c. Have 100% of the faculty involved in funded research projects.

12. Establish a \$250,000 endowment to support a first-class seminar program to assist with the costs of bringing in leading faculty members and industrial practitioners onto the MSU campus.

13. Establish and institute a policy that all graduate students will present their research work at a regional or national meeting prior to finishing their graduate degree. Additionally, all doctoral students will publish at least one peer-reviewed publication prior to completion of their degree.

14. Establish a strategic alliance between the School of Chemical Engineering and the Diagnostic Instrumentation and Analysis Laboratory (DIAL), the Center for Advanced Vehicular Systems, and the Biotechnology Institute on the MSU Campus.

15. Establish a strategic alliance with one national laboratory.

Alumni, Corporate Relations

16. More fully involve alumni with the School of Chemical Engineering.

- a. Establish a “young” alumni board with alumni less than 5 years after graduation.
- b. Increase annual alumni donations from \$2,000 to \$50,000 per year by 2007.
- c. Publish a biannual paper newsletter informing alumni of School activities.
- d. Publish an electronic newsletter every other month (6 times per year) to alumni and corporate friends
- e. Develop strategic partnerships with companies who hire significant numbers of MSU Chemical Engineering Student
- f. Sponsor annual Department Head visits to all companies that hire at least 10% of MSU Chemical Engineering Students.
- g. Develop a company appreciation day or similar event.

17. Ensure a diverse membership on the Chemical Engineering Advisory board including company and (or) research laboratory affiliation, industrial sector, age, experience, gender, and race.

Economic Development

18. Work cooperatively with the University of Mississippi and the University of Southern Mississippi to foster the growth of chemical and related industries in the state of Mississippi.

19. Work cooperatively with the University of Alabama to foster growth of chemical and related industries in the Tenn-Tom corridor

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