Summary:

Teaching, Advising, & Recruitment:

- Fall 2009 Undergraduate Enrollment: 93 (4th highest on campus)
- Fall 2009 Enrollment 26.6 students/FTE (2nd highest on campus)
- Fall 2009 Freshmen Enrollment: 18 (6th highest on campus)
- Fall 2009 Freshmen Enrollment/FTE: 5.1

Research:

- Expenditures: ~$500,000 for 2009
- Publications: 1 journal (Langmuir), 2 book chapters
- Presentations: 2 (ACS, SACNAS)
- Students: 2 PhD, 2 MS, 3 UG/MS, 4 REU, 8 UG

Goals for 2010:

1. Update lab safety items and develop long term safety plan.
2. Re-connect with alumni.
3. Achieve accreditation.
4. Move into new lab space when finished in May.
Chemical Engineering Program Mission:

The mission of our program is to engage and prepare students for professional careers which require command of the principles of Chemical Engineering. We will focus on the development of complete engineers who can foster innovation through know-how and champion ideas through effective communication. We will deliver a thorough education with insightful teaching, an innovative curriculum, research opportunities, summer job experiences, and channels for permanent, successful careers. All of our efforts are done in the context of providing the human and technical resources critical to enhancing the vitality of the State of New Mexico and the people and businesses that thrive within this region. Like our counterparts in industry, we recognize that achievement of our mission can only be accomplished by continual self-assessment and actions to improve.

Educational Objectives

The following objectives have been established by the program faculty in conjunction with our students and advisors from industry. They describe the characteristics and expected accomplishments of our future alumni.

1. Our graduates will be complete engineers who can: solve problems, experiment, innovate, be resourceful, and champion ideas through effective communication.

2. Our graduates will possess an understanding of the broad reach of a modern Chemical Engineering education and the array of knowledge required to implement solutions which will benefit our society.

3. Our graduates will be engaged in successful careers covering the spectrum of fields which require a command of the principles of Chemical Engineering.

4. Our graduates will benefit from a lifelong love of learning, opening doors to graduate study and enabling graduates to adapt to changes and opportunities in the profession.
Recommended Actions and Ownership for 2009 from IAB meeting:

1. Articulate long term assessment plan for Spring meeting (Owner: Faculty)

2. Prepare self-study for ABET (Owner: Faculty)

3. Increase unit-ops labs by 1 (Owner: Riley/Price)

4. Complete feasibility study to include safety in outcomes or objectives (Owner: Faculty)

5. Update all safety related items in the department for research and teaching
   Owner: Faculty/IAB

6. Identify another potential board member Owner: Faculty

7. Hold an alumni event (AIChE get together, 49’ers barbecue, M Mtn Run)
   Owner: Faculty
Teaching Effectiveness and Loads

The department reached a new record high of 1138 undergraduate student credit hours, which is almost a 20% increase over our previous high. This is due to Professor Riley stepping into nearly a full teaching load. The department did experience a large dip in graduate student credit hours. The graduate student credit hours should rebound now that each full time faculty member has taught a graduate course.

The teaching evaluations continue to be quite high. Overall teaching evaluations are shown for each professor for each course.

<table>
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<tr>
<th>Name</th>
<th>2002</th>
<th>2003</th>
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<th>2005</th>
<th>2006</th>
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<td>Dong</td>
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<td>4.31</td>
<td>4.08</td>
<td>4.09</td>
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<td>Jeon</td>
<td>3.58</td>
<td>3.85</td>
<td>3.42</td>
<td>3.78</td>
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<tr>
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<td>919</td>
<td>930</td>
<td>929</td>
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<tr>
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<td>78</td>
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<td>4.5/4.6</td>
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<td>Tartis</td>
<td>4.7/4.5</td>
<td>4.6/4.3/4.4/4</td>
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<tr>
<td>Riley</td>
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<td>3.6/4.1/4</td>
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<td>Weinkeff</td>
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<td>Average</td>
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<td>4.2</td>
<td>4.3</td>
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<tr>
<td>Total Graduate Student Credit Hrs</td>
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Research Productivity

All three active research faculty have externally funded research programs.

Professor Riley is part of the Grid Reliability group of research faculty. His group has had $60000 worth of expenditures between his start-up and DOE funding. His group consists of 1 MS student (Brock Romero) and 2 undergraduate students (Thomas Budner and Josh Hill).

Professor Tartis has received funding through the NIH INBRE program. Her lab had roughly $140,000 in research expenditures, which supported students, their research, and led to the purchase of 2 microscopes and an ultrasound system. Her group includes a PhD student in materials engineering (Elizabeth Larkin), two undergraduate students who plan on continuing on to a 5 year masters (Gil Martinelli and Jacy Gansz), and 5 undergraduate students (Mick Hahn, Lee Tu, Alyssa Rose, Caitlin Allen, Coco Abbou Oucherif). Professor Tartis also advised two students as a part of the NSF: Research Experience for Undergraduates at New Mexico Tech during the summer. Their work was presented at an ACS Colloids conference and at SACNAS and led to a publication in Langmuir in collaboration with colleagues at UNM.

Professor Leclerc also takes part in the DOE Grid Reliability program and also has funding through a DOE EPSCoR award with UNM. Combined the Leclerc Group has had $300,000 in research expenditures. The group includes one master’s in petroleum engineering (Rohan Gudgila), one doctoral student in materials engineering (Kavi Loganathan), one post-doctoral associate (Banasri Roy), and one undergraduate student who will convert to a Masters in Material Engineering (Clay Beevers). Two summer students were supervised by Professor Leclerc through the NSF: Research Experience for Undergraduates at New Mexico Tech. Rohan’s results led to two submitted abstracts and an invited talk at UNM’s Department of Chemical and Nuclear Engineering. Banasri’s results led to a submitted abstract. The EPSCoR award provided a new chemisorption apparatus that has unique capabilities on campus in identifying oxidation states, numbers of active sites, numbers of acid/base sites, and other properties of metal catalysts.
Enrollment:

The department continued to take part in large recruiting events like Exploration Day and Research at Tech Day. We offered the summer mini-course continuing the alternative energy theme. The enrollment for the department decreased to 93 from 96 the previous year. Despite the drop, the department is up considerably from the previous steady state, which was an enrollment in the mid-70’s. The effects of this large increase will be seen in the upcoming year or two as chemical engineering labs are exposed to the higher enrollments. A key strategic goal of the department is to increase the number of lab modules for our lab courses.

Despite the slight drop in enrollment, we still have an unusually high student to faculty ratio. Figure 1 below shows undergraduate enrollments per FTE in several departments. Chemical engineering is one of two departments to have student to faculty ratios significantly over 15:1.

![Figure 1. Undergraduate Enrollments at NMT per FTE](image)

Last and perhaps most importantly, our students continue to excel at the institute and national levels and are recognized for their work by winning prestigious awards.

-Peter Valdez won the Brown Award at the 2009 commencement.
- Caitlin Allen was named a Macey Scholar at New Mexico Tech.
- Caitlin Allen was an honorable mention for a Goldwater Fellowship.
Student Learning and Pending Modifications to the Curriculum:

Alumni Surveys:

Alumni surveys were sent out to alumni 0, 1, and 3 years out from graduation. The goal is to obtain feedback about the program in general and regarding program objectives and outcomes. In terms of success in reaching alumni, the success rates were 58%, 73%, and 33% for the three classes of students contacted.

Industrial Advisory Board:

The industrial advisory board met with students and faculty twice this past year. In the spring meeting, the board members attended senior design presentations and provided feedback to the faculty.

In the fall meeting, the board was updated on the status of the department, met with students, and gave feedback to the faculty.

At the fall meeting, Jason Harper, a department alum, joined the industrial advisory board.

FE Exam Results Review:

FE Exam results were reviewed at the Fall Advisory Board Meeting. No specific recommendations were made based on the results reviewed in the fall.