STRATEGIC PLAN FOR THE

UIC COLLEGE OF ENGINEERING

FOR 2010

Prith Banerjee
Dean, College of Engineering
University of Illinois at Chicago
Room 838 SEO
851 South Morgan Street
Chicago, IL 60607-7043
Ph: (312) 996-2400
Fax: (312) 996-8664
EMAIL: prith@uic.edu
URL: www.engr.uic.edu

June 30, 2006

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. Statement of strategic intent

The College of Engineering at the University of Illinois at Chicago is a strong engineering school and is poised to be one of the premier schools of engineering in Chicago, in the State of Illinois, and in the country. Our intent is to develop a strategy to become more agile and responsive to the nation's needs and provide a truly remarkable student experience so that we can enhance our position of strength and reputation in the nation.

2. Mission statement

The mission of the UIC College of Engineering is to address the needs of the State and nation through excellence in education, research, and service; to educate students for careers of leadership and innovation in engineering and related fields; to expand the base of engineering knowledge through original research, developing technology to serve the needs of society; and to benefit the public through service to industry, government and the engineering profession.

3. Summary of planning process

The College of Engineering had started its Strategic Planning process in August 2004 before President Joe White's engagement of the entire university in a Strategic Planning process. The Dean of Engineering appointed a Strategic Planning Committee consisting of the six Department Heads, the Associate and Assistant Deans, and the Executive Committee of the College of Engineering. This committee met twice a month during August, September, October, November and December 2004 to develop an original version of the plan. The Dean solicited feedback on the strategic plan from the faculty during faculty meetings held on September 9, October 21, December 8, 2004, December 15, 2004, and January 13, 2005. The Dean also updated the Provost and various Vice Provosts on various aspects of the plan during individual meetings during October and November, 2004. The Dean presented the strategic plan to various alumni of the College on September 28, October 19, and November 17, 2004. In addition, the Dean presented the strategic plan to the staff of the College on December 16, 2004. Finally, the Dean solicited feedback from the undergraduate and graduate students of the College in 12 separate meetings by departments and by ranks (undergrads and grads) during January and February 2005. This strategic plan has therefore been vetted by all the constituents of the College of Engineering (faculty, staff, students, alumni and administrators). The College Executive Committee voted (8 Yes, 0 No) in support of the plan on Thursday Jan. 13, 2005. The College of Engineering faculty vote voted using a secret ballot (94 Yes, 3 No, and 1 Abstain) in support of the plan on Thursday Jan. 13, 2005. Subsequently, when President Joe White engaged the University of Illinois in a Strategic Planning Exercise, the College of Engineering revised the plan according to the new suggested format. The new plan was endorsed by the College Industrial Advisory Board in October 2005. The new plan was endorsed by the College Executive Committee and the College faculty in December 2005.

4. Vision

UIC seeks to embody the ideal of a public university: to cultivate the highest intellectual ambitions of faculty, students and staff and, at the same time, contribute to the making of a more egalitarian society. We will be a resource and destination accessible to all who share our ambitions and have the desire to excel. We seek to be a leading research university and a great urban institution, taking advantage of the opportunities and needs presented to and by the state of Illinois and the city of Chicago. The UIC College of Engineering wishes to contribute to the overall vision of UIC by helping to educate students for careers of leadership and innovation in engineering and related fields; by expanding the base of engineering knowledge through original research, by developing technology to serve the needs of society; and by benefiting the public through service to industry, government and the engineering profession.

5. Critical factors determining success (environmental/competitive analysis highlights)

The strengths of the UIC College of Engineering are:

- A very high quality faculty (out of 114 faculty, two are NAE members, 43 are Fellows of their societies, 19 are NSF CAREER award winners)
- We have strong interdisciplinary research programs in Biotechnology, Nanotechnology, Information Technology and Energy/Environment and Infrastructure Technology.
- Proximity to a large UIC Medical School, and ability of the COE faculty to do interdisciplinary research in bio-technology related areas.

The weaknesses of the UIC College of Engineering are:

- Image of UIC as a "commuter school" because of its urban location;
- Currently, the average age of our alumni base is 42 years. In the near term, this represents a significant challenge for our fund raising activities.
- The campus landscape is not terribly impressive; hence students and their parents are not captivated at first glance; most of the buildings are old.
- There is a perceived tension between admission standards and the mission of making engineering education accessible to the widest possible community.

The opportunities of the UIC College of Engineering include:

- Location in the city of Chicago
- Ability to attract excellent faculty; because of the urban location
- Proximity to industry in Chicago and neighboring areas; hence the ability for faculty to perform industry relevant research, and for students to be placed in these companies.
- Research is becoming more interdisciplinary and collaborative in nature. The strategic plan calls for developing interdisciplinary areas of Biotechnology, Nano-technology, Information Technology, and Energy/Environmental technology.

The threats of the UIC College of Engineering are:

- The lack of interest in our high school students to pursue careers in science and engineering, and their overall lack of preparedness in math and science has led to a decrease in engineering student enrollments across the country and at UIC. The UIC COE undergraduate student enrollment has declined from 1900 in 2000 to about 1550 for Fall 2005. Our plan calls for increasing that to 1900 by the year 2010.

- UIC College of Engineering is dwarfed by the UIUC College of Engineering in terms of size and reputation.
- UIC College of Engineering is ranked 59th nationally, and the public (wrongly) does not have the perception of a strong engineering college from a research perspective. UIC has competition in Chicago from Northwestern University and the Illinois Institute of Technology, in the state of Illinois from UIUC, and in the midwest from the Big Ten institutions.
- Legislators in the State of Illinois have believed that the state can only afford to support one strong engineering school, i.e., UIUC.

6. Strategic goals with summary of supporting strategies

The specific goals and strategic thrusts for each of these issues are summarized below by categories.

- Goal 1. Recruit, Retain and Promote Outstanding Faculty
- Goal 2. Increase our Research Enterprise through Interdisciplinary and Collaborative Research
- Goal 3. Improve our Undergraduate Program and Recruit and Retain Excellent Undergraduate Students
- Goal 4. Improve our Graduate Program and Recruit and Retain Excellent Graduate Students
- Goal 5. Develop Professional and International Programs
- Goal 6. Cultivate and Promote Corporate and Alumni Relations
- Goal 7. Aggressively Improve Marketing and Rankings
- Goal 8. Provide Efficient Administration and Staff

Table 1 summarizes the key elements of our strategic plan for 2010.

Table 1. Key Elements of the Strategic Plan for 2010.

Issues	**Year 2005**	**Year 2010**
Faculty size	114	130
Research Funding	$21 million	$40 million
Undergraduate Students Enrolled (Fall '04)	1,550	1,900
Undergraduate students graduated per year	366 B.S.	450 B.S.
Graduate Student Enrolled (Fall '04)	439 Ph.D, 422 MS, 861 total	600 Ph.D, 400 MS, 1000 total
Graduate students graduated per year	41 Ph.D., 200 M.S.	60 Ph.D., 200 M.S.
Space	267,000 sq ft	417,000 sq ft (including new building)
Staff	73	75
Teaching Assistants	92	96
Alumni and Corporate Fund	$75 million total ($5 million	$50 million total ($38

Raising	cash)	million cash)
State Base Budget	$16.4 million	$19.6 million
Indirect Cost Funds from Research	36.5% ICR ($2 million)	50% ICR ($5.3 million)
US News Rankings of Engineering College	59	40

The following are the key elements of the strategic plan. We wish to make a significant improvement in our graduate program and research enterprise so that our ranking of the graduate program in engineering moves up from our current ranking of 59 to a ranking of 40 among the top 300 engineering schools in the USA. In order to accomplish our objectives of improved graduate rankings, we plan to do several things. First, we plan to increase the total number of Ph.D. students relative to the M.S. students from our current equal numbers of 425 PhD and 425 MS to about 600 Ph.D and 400 MS students. We will adopt policies to improve the retention of our PhD. students in view of the observation that out of 425 PhD students, we currently graduate only 35 PhD students per year. We plan to provide financial support of our PhD. students for 5 years during their Ph.D using Teaching Assistantships, Research Assistantships, Graduate Assistantships and Fellowships. This will result in about 100 Ph.D. students graduating per year in the steady state with 600 Ph.D. students (by 2010 we will reach 60 PhD graduates). In order to support 600 Ph.D. students we will need in double our research operation from $21 million per year to $40 million per year.

We will increase the research enterprise through three approaches. First, we will increase our faculty from 115 faculty to about 130 faculty. Over the next 5 years, we will hire 15 new faculty and 15 replacement faculty in the College. These 30 new faculty will be expected to bring in more research funding. The increase in the faculty positions will be supported by the increased tuition revenue from an increase in our undergraduate enrollment from 1550 to 1900 students. Second, we plan to bring in large collaborative research projects in interdisciplinary research areas: Biotechnology, Nanotechnology, Information Technology and Energy/Environmental Technology. Third, we plan to bring in shorter term research and development contracts from industry through the notion of Technology Centers. The increased research operation will need a new College of Engineering building:

Our stretch goals for the College include the following:

- Hiring several senior faculty members who are members of the National Academy of Engineering
- Securing several large collaborative center grants such as NSF Engineering Research Centers. We hope to bring in $10 million of large collaborative research grants per year by 2010.
- Establishing a strong Technology Center services operation involving strong ties to industry. We plan to bring in about $10 million of Technology Center grants per year by 2010.

- Securing funding for a new College of Engineering building of about 150,000 sq ft. that will cost us about $45 million.

7. Purpose of the plan and what you expect as outcome (potentially resource-related)

The strategic plan is a clearly written document of where we are today, our strengths and weaknesses, specific objectives of where we want to be in 2010, and a clear roadmap of specific actions that need to be taken in order to achieve those objectives. The subsequent chapters describe various issues facing the college, namely, what we need to do in terms of faculty, research, undergraduate programs, graduate programs, professional programs, corporate and alumni relations, marketing and rankings, space and infrastructure, administration and staff, and financial planning.

8. *Call to readers and/or stakeholders for participation*

UIC College of Engineering (COE)'s characteristics and location open up a range of opportunities for the generation of support. Increasingly we will turn to private philanthropy, entrepreneurial interpretation of our mission, and to the beneficiaries of our efforts in research, education and patient care for the support UIC COE needs to thrive. We believe UIC has a glowing future ahead as the public research university in the City of Chicago, with a prime location and an essential mission for the State of Illinois.

SECTION 1

PURPOSE

1.1. MISSION

The Mission of the UIC College of Engineering is to address the needs of the State and nation through excellence in education, research, and service; to educate students for careers of leadership and innovation in engineering and related fields; to expand the base of engineering knowledge through original research, developing technology to serve the needs of society; and to benefit the public through service to industry, government and the engineering profession.

1.2. VISION

UIC seeks to embody the ideal of a public university: to cultivate the highest intellectual ambitions of faculty, students and staff and, at the same time, contribute to the making of a more egalitarian society. We will be a resource and destination accessible to all who share our ambitions and have the desire to excel. We seek to be a leading research university and a great urban institution, taking advantage of the opportunities and needs presented to and by the state of Illinois and the city of Chicago. The UIC College of Engineering wishes to contribute to the overall vision of UIC by helping to educate students for careers of leadership and innovation in engineering and related fields; by expanding the base of engineering knowledge through original research, by developing technology to serve the needs of society; and by benefiting the public through service to industry, government and the engineering profession.

1.3. GUIDING VALUES

The values of the College of Engineering at UIC will be guided by the guiding values of the University of Illinois system, and the University of Illinois at Chicago in particular. Specifically, the guiding values of the University of Illinois are to:

- Aim high
- Strive to control our destiny
- Be accountable for our actions and exercise responsible stewardship
- Foster diversity, be inclusive, treat each other with dignity and respect, and promote citizenship
- Value excellence, quality and service
- Foster innovation and creativity

The guiding values of UIC are to promote:

- *Knowledge* that leads to global as well as individual transformations
- *Access* to excellence
- *Openness* to the world of ideas and urban and global change
- *Excellence* in every facet of intellectual life and in the physical, cultural, developmental environment that sustains academic achievement
- *Collaboration* in scholarship, problem-solving and innovation

1.4. MANDATES

We will review the statutory mandate of the University of Illinois system of which the UIC College of Engineering is a part of.

The basic mandates impacting the University are the University of Illinois Act (110 ILCS 305) which created the University and established its mission, and the University of Illinois Trustees Act (110 ILCS 310) which sets forth the powers, responsibilities, and membership of the Board of Trustees (BOT). Other important University-specific mandates include the state statutes establishing the University of Illinois at Chicago (110 ILCS 320), University of Illinois at Springfield (110 ILCS 327), and University of Illinois Hospital (110 ILCS 330). Together, these statutes indicate that the University will have teaching, research, service, and economic development as core mission activities.

As an entity of the State of Illinois, the University is also subject to state oversight and regulations and must abide by the state constitution and statutes. Key statutory requirements pertaining to state entities (including public universities) include the following:

• Open Meetings Act
• Freedom of Information Act
• Governmental Ethics Act
• State Officials and Employees EthicsAct
• State Finance Act
• State Auditing Act
• Illinois Procurement Code
• Architectural, Engineering, and Land Surveying Qualifications Based Selection Act
• State Property Control Act
• State Universities Civil Service Act
• University of Illinois Revenue Bond Financing Act for Auxiliary Facilities
• University of Illinois Revenue Bond Act
• Illinois Educational Labor Relations Act
• Legislative Audit Commission –University Guidelines

At the federal level, the University's mission as the state's land grant institution was

established by the Morrill Act of 1862 and further extended through the Hatch Act of 1887 (establishing agricultural experiment stations) and the Smith-Lever Act of 1914 (establishing the cooperative extension function).

SECTION 2

STRATEGY

2.1. STATEMENT OF STRATEGIC INTENT

The College of Engineering at the University of Illinois at Chicago is a strong engineering school and is poised to be one of the premier schools of engineering in Chicago, in the State of Illinois, and in the country. Our challenge is to figure out a strategy to become more agile and responsive to the nation's needs and provide a truly remarkable student experience so that we can enhance our position of strength and reputation in the nation.

The UIC College of Engineering is recognized for its academic excellence with undergraduate and graduate programs in its six academic departments: Bioengineering, Chemical Engineering, Civil and Materials Engineering, Computer Science, Electrical and Computer Engineering, and Mechanical and Industrial Engineering. For the fall '05 semester, the College of Engineering has 114 faculty, 1,550 undergraduate and 854 graduate students in 2006. Two of our College faculty are Members of the National Academy of Engineering. 42 of the College's faculty are Fellows of their societies, about 20 are National Science Foundation CAREER or Presidential Young Investigator Award winners, and more than 11 are Editors-in-chief of major research journals. The research programs at the UIC College of Engineering have been growing rapidly over the years and are conducted in six departments and eight interdisciplinary centers. During 2004-05, the total research expenditure for the College was about $21 million.

2.2. ENVIRONMENTAL ASSESSMENT

In the 21st century, engineering schools across the nation are facing numerous challenges both within and outside the academic setting. Many disciplines of engineering are undergoing rapid and pervasive changes, and many aspects of modern life are becoming increasingly dependent on emerging technologies and the scientific framework in which they evolve. The explosion of the computing and communications industry, access to tremendous amounts of information and computing resources in research, rapid advances in the fields of nano-technology and bio-technology, new national security challenges, expanded economic competition, urgent public health needs, and a growing global awareness of environmental deterioration bring new opportunities for varied careers in engineering. We expect our students to continue the expansion of fundamental knowledge and apply their knowledge to the world. The world of work has become more interdisciplinary, collaborative, and global. Hence engineering schools of the 21st century need to produce young engineers who are adaptable and flexible, as well as technically proficient.

One of the threats facing all Colleges of Engineering and the UIC COE in particular is that Engineering is not being valued as an attractive field to pursue among high school students pursing careers. The United States graduated only 70,000 B.S. graduates in science and engineering in 2004 which is a reduction from a high of about 90,000 B.S. graduates in 2000. In comparison, countries such as China and India are graduating more than 500,000 engineering graduates each year. The lack of interest in our high school students to pursue careers in science and engineering, and their overall lack of preparedness in math and science has led to a decrease in engineering student enrollments across the country and at UIC. The UIC COE undergraduate student enrollment has reduced from 1900 in 2000 to about 1550 in fall 2005.

Global competitiveness requires that our engineering college contribute substantially to the diverse high technology of the State of Illinois. We need to do so through participation in broad economic development projects, the University of Illinois at Chicago's Great Cities program, and through our intellectual property development and collaboration with the Office of Technology Management, among others. Another basis for our competitive ability will be our strong partnerships with industry which provide both research support and student support.

One of the unique aspects of UIC is that it is a comprehensive research university, yet it greatly values undergraduate education and is committed to making its education available to students of all backgrounds. One challenge is to continuously improve in research and graduate studies without compromising the quality of our undergraduate education. Another challenge is that of the relatively small size of the school. The strongest engineering schools are typically much larger in terms of the size of the faculty, the student body, and the size of their research programs. Since the size of the engineering school is not expected to double or triple in either the size of the faculty, or the student population, or space, the challenge is in developing a strategy to improve the school's reputation and rankings without significantly increasing the size of the school. A third challenge is that the UIC COE has been tremendously resource limited in terms of support of endowed chairs for faculty, faculty startup packages, matching grants for faculty research, space for instruction and research, graduate student fellowships and teaching assistantships, and laboratory and computing facilities. In view of the recent economic downturn, it has been difficult raising funding for support of many of these activities in the recent past. However, as the economy is turning around, there is an opportunity to raise funds from wealthy alumni and profitable corporations. During the past ten years, the College made major strides in transforming itself into a major research enterprise. The College is now ready to take on the new challenge.

2.3. COMPETITIVE BENCHMARK ANALYSIS

It is widely known that rankings of engineering colleges are very subjective since they are often times based on perceptions and not hard reality. One ranking that is widely respected in academia is the ranking performed by the National Research Council (NRC). However, the NRC does its rankings only once every 12 years. It takes into account a

large set of criteria such as quality and reputation of faculty, quality and quantity of the research, quality of the educational programs, etc. However, since the rankings are not done very frequently, it is hard for universities to show much change in reputation in the short term.

More recently, the US News and World Reports magazine has started publishing rankings of graduate programs and undergraduate programs in various fields including engineering. While in the past, the rankings were based on only subjective metrics like "reputation ranking by peers", more recently, this ranking has started taking into account quality of graduate students as measured by average GRE scores, the number of Ph.D. students graduating each year, and quality of faculty as measured by percentage of faculty who are members of the National Academy of Engineering, and quantity of research as measured by the total research expenditures per year as well as the research expenditures per faculty per year.

The College of Engineering was ranked 59th overall in US News and World Report rankings of Graduate Programs during 2005. Although we may argue that the US News rankings are not very scientific, our constituents, namely, our students, the parents of students, prospective new faculty, companies recruiting our students, and agencies funding our research all look at these rankings.

It is well known that the top engineering schools are much larger in terms of faculty size, Ph.D. production, research publications, and research funding. For example top ranked MIT has 350 research active faculty, 1400 Ph.D. students, 200 Ph.D. graduates per year, and $241 million in research funding ($685,000 per faculty). Second ranked Stanford has 165 faculty, 825 Ph.D. students, 229 Ph.D. graduates per year, and $120 million in research funding ($730,000 per faculty). Third ranked UIUC has 360 research active faculty, 1500 Ph.D. students, 186 Ph.D. graduates per year, and $213 million in funding ($590,000 per faculty). Fourth ranked Berkeley had 212 research active faculty, 1200 Ph.D. students, 186 Ph.D. graduates per year, and $121 million in funding ($571,000 per faculty). Fifth ranked Georgia Tech has 477 research active faculty, 1900 Ph.D. students, 179 Ph.D. graduates per year, and $187 million in funding ($392,000 per faculty). In comparison, UIC is quite small, and has about 100 research active faculty, 425 Ph.D. students, 41 Ph.D. graduates per year, and $21 million in funding ($200,000 per active research faculty). However, one does not always have to be a large college to be highly ranked. For example, Caltech has 96 research active faculty, 461 Ph.D. students, 57 Ph.D. graduates per year, and $48 million in funding ($500,000 of funding per faculty). Princeton has 127 faculty, 482 Ph.D. students, 51 Ph.D. graduates per year, and $56 million in funding ($442,000 in research funding per faculty). The key approach to improve in rankings and reputation is through growing ***selective areas of excellence***. We elaborate on this further in the strategic plan later in this document.

Table 2.1 reports the US News data on rankings of graduate programs for engineering colleges in various research universities for 2006. Only the overall score on a scale of 100, and peer ranking and recruiter ranking on a 5 point scale are shown. In addition, US News uses criteria such as graduate student quality, faculty quality, number of Ph.D.

students, and total research funding in its metrics. In this ranking the UIC College of Engineering is ranked 59 out of more than 167 universities that confer engineering degrees. Only the top 5 and universities ranked 50-60 are listed in the table. The top five are shown to see how high we can aspire to achieve. The schools ranked 50-60 are are immediate competitors. The strategic plan for the college is to see if UIC can move to a rank of 40 in the next five years. It is important to review the reputation of the universities who are ranked 50 through 60, and compare UIC to this list.

Table 2.1. US News and World Report Rankings of Engineering Colleges for Graduate Programs in 2006 (out of 167 schools). UIC is ranked 59th.

Rank	Overall Score	Peer Assessment	Recruiter Assessment
1. MIT	100	4.9	4.8
2. Stanford	95	4.9	4.7
3. Univ. California Berkeley	87	4.8	4.5
4. Georgia Institute of Tech	83	4.5	4.3
4. Univ. of Illinois - Urbana-Champaign	83	4.6	4.4
40. Case Western Reserve Univ.	43	3.4	3.5
40. Univ. California Irvine ***(Samueli)***	43	3.2	3.4
40. Univ. of Rochester	43	2.8	3
43. Dartmouth College ***(Thayer)***	41	3.1	3.4
43. Iowa State University	41	3.3	3.4
43. Lehigh University ***(Rossin)***	41	3.2	3.4
43. Rutgers State University	41	3.1	3.2
47. Arizona State University ***(Fulton)***	40	3.3	3.2
47. Univ. of Delaware	40	3	3.4
49. Brown Univ.	39	3.4	3.5
49. Univ. of Pittsburg	39	3	3.3
51. Univ. of Massachusetts Amherst	38	3	3.3
51. Univ. of Notre Dame	38	3.2	3.5
51. Vanderbilt Univ.	38	3.2	3.2
54. Boston University	37	2.9	3
55. University of Arizona	36	3.3	3.2
56. University of Buffalo - SUNY	35	2.9	2.9
56. Univ. of Iowa	35	3	3.1
58. Michigan State University	34	3.2	3.2
59. University of Illinois - Chicago	**33**	**2.9**	**3.2**
59. University of Utah	33	2.9	3.1
61. Colorado State Univ.	32	2.8	3.1
61. Drexel University	32	2.9	3.2
61. Illinois Inst Tech ***(Armour)***	32	2.8	3.2

We now study rankings of the Colleges based on various metrics. Table 2.2. shows the rankings of the Engineering colleges are ranked 1-5 and 50-60 based on NAE membership, research funding (total for a year), and the research funding per faculty.

Table 2.2. Engineering College Rankings Based on Research Funding.

Rank	NAE membership	Research expenditures (millions)	Research per faculty (1000)
1. MIT	12.70%	$216.50	$614.90
2. Stanford	14.50%	$130.40	$665.40
3. Univ. California Berkeley	19.00%	$119.90	$477.80
4. Georgia Institute of Tech	5.1%	$205.30	$430.50
4. Univ. of Illinois - Urbana-Champaign	2.7%	$175.10	$428.10
40. Case Western Reserve Univ.	2.7%	$41.7	$379.30
40. Univ. California Irvine ***(Samueli)***	5.7%	$38.8	$279.40
40. Univ. of Rochester	1.2%	$66.3	$838.70
43. Dartmouth College ***(Thayer)***	2.6%	$22.5	$593.20
43. Iowa State University	1.4%	$49.1	$237.30
43. Lehigh University ***(Rossin)***	7.4%	$28.2	$239.20
43. Rutgers State University	3.8%	$79.6	$408.00
47. Arizona State University ***(Fulton)***	2.7%	$42.2	$219.80
47. Univ. of Delaware	2.1%	$29.9	$328.30
49. Brown Univ.	6.9%	$15.7	$291.10
49. Univ. of Pittsburg	4.2%	$45.5	$382.00
51. Univ. of Massachusetts Amherst	0.7%	$35.2	$260.40
51. Univ. of Notre Dame	2.0%	$19.4	$204.60
51. Vanderbilt Univ.	1.2%	$28.8	$343.10
54. Boston University	2.8%	$46.2	$376.00
55. University of Arizona	2.5%	$27.1	$166.10
56. University of Buffalo - SUNY	0.9%	$34.5	$307.90
56. Univ. of Iowa	1.1%	$26.9	$292.10
58. Michigan State University	0.0%	$25.0	$168.90
59. University of Illinois - Chicago	**0.0%**	**$22.7**	**$204.40**
59. University of Utah	3.4%	$33.6	$292.00
61. Colorado State Univ.	1.0%	$41.8	$522.00
61. Drexel University	2.5%	$28.9	$238.90
61. Illinois Inst Tech ***(Armour)***	2.2%	$20.0	$212.90

Table 2.3 shows the rankings of the Engineering colleges that are ranked 1-5 and 50-60 based on quality and quantity of graduate students. It uses metrics for quality such as average GRE quantitative scores (out of a maximum 800). It uses the metric of Admission Rate (percentage of students that are admitted to a graduate program among

all students who apply) as a measure of how selective this program is. It also uses the data of Ph.D. students to faculty ratio, and the total number of Ph.D. students who graduate per year.

Table 2.3. Ranking Based on Graduate Students.

Rank	Avg GRE quant	Acceptance rate	PhD students/faculty	PhD granted	Total graduate enrollment
1. MIT	770	25.30%	4.1	206	2,727
2. Stanford	774	35.50%	5	230	3,150
3. Univ. California Berkeley	766	16.20%	4.7	164	1,722
4. Georgia Institute of Tech	755	31.60%	4.2	246	3,705
4. Univ. of Illinois - Urbana-Champaign	769	17.80%	4.3	171	2,679
40. Case Western Reserve Univ.	744	26.80%	2.4	53	631
40. Univ. California Irvine ***(Samueli)***	747	20.90%	4.7	43	956
40. Univ. of Rochester	743	13.30%	3.4	24	349
43. Dartmouth College ***(Thayer)***	748	15.70%	2.5	11	196
43. Iowa State University	765	17.50%	2.2	58	988
43. Lehigh University ***(Rossin)***	770	30.10%	2.8	43	558
43. Rutgers State University	746	20.60%	1.4	43	880
47. Arizona State University ***(Fulton)***	746	32.20%	2.9	74	1,448
47. Univ. of Delaware	744	25.40%	4.3	52	637
49. Brown Univ.	N/A	21.10%	2.9	14	217
49. Univ. of Pittsburg	742	29.70%	2.4	34	649
51. Univ. of Massachusetts Amherst	755	14.50%	3.4	59	715
51. Univ. of Notre Dame	768	24.30%	3.5	33	401
51. Vanderbilt Univ.	756	11.40%	3.5	26	391
54. Boston University	752	30.80%	3.2	51	640
55. University of Arizona	726	41.60%	2.8	47	914
56. University of Buffalo - SUNY	762	32.00%	2.8	51	1,125
56. Univ. of Iowa	728	21.80%	3.4	37	489
58. Michigan State University	753	11.00%	2.5	45	576
59. University of Illinois - Chicago	**749**	**23.30%**	**3.3**	**30**	**900**
59. University of Utah	731	49.00%	1.9	37	719
61. Colorado State Univ.	726	46.30%	1	27	579
61. Drexel University	741	45.40%	2	34	965
61. Illinois Inst Tech ***(Armour)***	741	57.90%	1.2	32	1,418

In addition to ranking the College of Engineering, the US News and World Report each year also ranks each department in each university. These rankings are done using very subjective metrics, namely that of the perceptions of various Deans and department heads

of the reputations of other universities. The rankings of various departments is shown in Table 2.4.

Table 2.4. Rankings of various UIC Engineering departments.

DEPARTMENT	Ranking
Bioengineering	46
Chemical Engineering	55
Civil Engineering	78
Computer Engineering	65
Electrical Engineering	64
Mechanical Engineering	53

2.4. STRENGTH, WEAKNESS, OPPORTUNITIES AND THREAT ANALYSIS

We now list the strengths of the UIC College of Engineering:

- A very high quality faculty (out of 114 faculty, two are NAE members, 42 are Fellows of their societies, 20 are NSF CAREER award winners, and 11 are Editors-in-Chief of Journals)
- We have strong interdisciplinary research programs in Biotechnology, Nanotechnology, Information Technology and Energy/Environment and Infrastructure Technology.
- Proximity to a large UIC Medical School, and ability of the COE faculty to do interdisciplinary research in bio-technology related areas.

We now list the weaknesses of the UIC College of Engineering:

- Image of UIC as a "commuter school" because of its urban location; lack of on campus housing makes it difficult to attract undergraduates; there are not enough dormitory rooms for students.
- Currently, the average age of our alumni base is 42 years. From a fund raising perspective, this is quite young. In the near term, this represents a significant challenge for our fund raising activities.
- The campus landscape is not terribly impressive; hence students and their parents are not captivated at first glance; most of the buildings are old.
- Contradiction of access and excellence. UIC has an overall mission of providing education to students from all financial backgrounds, hence there is a perceived tension between admission standards and the mission of making engineering education accessible to the widest possible community. In the future, we must recognize that access to excellence strengthens UIC's mission.

We now list the opportunities of the UIC College of Engineering:

- Location in the city of Chicago, and excellent connections to other cities in the US through O'Hare and Midway airports.

- Ability to attract excellent faculty; because of the urban location, there is a high quality of life, great cultural attractions, and a large array of spousal job opportunities.
- Proximity to industry in Chicago and neighboring areas; hence the ability for faculty to perform industry relevant research, and for students to be placed in these companies.
- Research is becoming more interdisciplinary and collaborative in nature. The strategic plan calls for developing interdisciplinary areas of Biotechnology, Nano-technology, Information Technology, and Energy/Environmental technology.

We now list the threats of the UIC College of Engineering:

- Engineering is not being valued as an attractive field to pursue among high school students pursing careers. The United States graduated only 70,000 B.S. graduates in science and engineering in 2004 which is a reduction from a high of about 90,000 B.S. graduates in 2000. In comparison, countries such as China and India are graduating more than 500,000 engineering graduates each year. The lack of interest in our high school students to pursue careers in science and engineering, and their overall lack of preparedness in math and science has led to a decrease in engineering student enrollments across the country and at UIC. The UIC COE undergraduate student enrollment has reduced from 1900 in 2000 to about 1550 for fall ' 2005.
- UIC College of Engineering is dwarfed by the UIUC College of Engineering in terms of size and reputation.
- UIC College of Engineering is ranked 59th nationally, and the public (wrongly) does not have the perception of a strong engineering college from a research perspective. UIC has competition in Chicago from Northwestern University and the Illinois Institute of Technology, in the state of Illinois from UIUC, and in the midwest from the Big Ten institutions. It is hard to change perceptions.
- Legislatures in the State of Illinois have believed that the state can only afford to support one strong engineering school, i.e., UIUC; however, one needs only to look toward other states like California with multiple highly ranked colleges of engineering (Berkeley, UCLA, UC, Santa Barbara, UC, San Diego, and UC, Irvine), Michigan (with the University of Michigan and Michigan State University), and Iowa (with the University of Iowa and Iowa State University). The realities facing us today and in the future demand a huge supply of creative and well-trained engineers. An accessible, highly ranked state College of Engineering in Illinois' largest metropolitan area seems an obvious answer to this need.

2.5. KEY STRATEGIC ISSUES FACING THE COLLEGE

The following strategic issues are facing the College:

- Faculty
- Research
- Undergraduate Program
- Graduate Program

- Professional Masters and International Programs
- Corporate and Alumni Relations
- Marketing and Rankings
- Administration and Staff

2.6. STRATEGIC GOALS AND THRUSTS

The specific goals and strategic thrusts for each of these issues are summarized below by categories.

- Goal 1. Recruit, Retain and Promote Outstanding Faculty
- Goal 2. Increase our Research Enterprise through Interdisciplinary and Collaborative Research
- Goal 3. Improve our Undergraduate Program and Recruit and Retain Excellent Undergraduate Students
- Goal 4. Improve our Graduate Program and Recruit and Retain Excellent Graduate Students
- Goal 5. Develop Professional and International Programs
- Goal 6. Cultivate and Promote Corporate and Alumni Relations
- Goal 7. Aggressively Improve Marketing and Rankings
- Goal 8. Provide Efficient Administration and Staff

We now provide detailed goals and action plans for each of these areas.

2.6.1. Goal 1. Recruit, Retain and Promote Outstanding Faculty

The specific objectives under for 2010 for faculty are:

- Grow the total faculty size of the college to 130 faculty from its current 114 faculty positions.
- Hire a total of 16 new and 12 replacement faculty through retirements and resignations
- Recruit faculty in clusters by growing selective areas of excellence
- Promote only the best faculty with national and international reputations
- Appoint four faculty as Chaired Professors
- Appoint 12 faculty with Professorships
- Have 75% of our Full Professors as Fellows of their societies such as IEEE, ASME, ASCE, ACM
- Have 50% of our Assistant Professors receive NSF CAREER awards by the time they are promoted to Associate Professorship
- Have 50% of our faculty on Program Committees of conferences each year
- Have 25% of our faculty on Editorships of major journals each year
- Have two faculty in the Membership of the National Academy of Engineering
- Have women and minority individuals comprise at least 10% of our faculty; 15% of the new hires should be women or minorities.

Action Plan

The faculty are the key to the reputation of any engineering school. Faculty members establish research programs, attract funding and graduate students, and recognition. In the following we will review our action plan to recruit, promote, and retain excellent faculty.

Recruiting

The UIC COE has a size of about 114 faculty in six departments; its size is small. The strongest engineering schools are typically much larger in terms of the size of the faculty. In view of that, we plan to grow the faculty size by about 15% to about 130 faculty. In addition, we will recruit new faculty as the result of retirements, resignations, and replacements.

We will develop a plan for faculty recruiting based on factors such as strong departmental rankings, a strong university reputation, leveraging the geographical location of Chicago, excellent departmental and school culture of support, and high startup funding.

Each department will develop long term plans for recruiting faculty. We will develop plans to hire faculty in research clusters in order to develop **selective areas of excellence** instead of distributing our resources thinly to cover all areas. Since the College will be hiring about 28 new faculty (16 additional and 12 replacement), each department will be asked to develop plans for faculty recruiting around such thematic clusters in the long run.

At a college level, we will hire faculty in the interdisciplinary areas of biotechnology, materials and nanotechnology, computing and information technology, and infrastructure and energy/environmental technology. Faculty that are hired in these interdisciplinary areas can span multiple departments. For example, Bio-technology faculty can be hired into the Bioengineering, Chemical Engineering, and Mechanical Engineering departments, Nanotechnology faculty can be hired into Electrical and Computer Engineering, Mechanical, and Civil/Materials Engineering departments, Information Technology faculty can be hired into Computer Science and Electrical and Computer Engineering departments, and Infrastructure and Energy/Environmental Technology faculty can be hired into Civil and Materials, Mechanical and Industrial, and Electrical and Computer Engineering departments.

New faculty can be hired at both junior and senior levels. We will primarily recruit junior faculty because they are the most motivated in terms of teaching and research, they will become the leaders of the future, and the cost of recruiting junior faculty is low. We will make senior faculty hires selectively. We will focus our energy on primarily Assistant Professors from the pool of fresh Ph.D. candidates. The advantage of hiring mainly junior faculty is that we can hire a greater number of faculty at lower starting salaries and start-up costs, and they can be evaluated for their teaching, research and service contributions to UIC before granting them tenure. Faculty hiring is a long-term investment and has to be done right.

While we will be open to recruiting the best faculty candidates from anywhere in the world, we will place extra emphasis on trying to recruit fresh Ph.D.s from the top 20 universities in the United States in each department's field (as published in the US News and World Report). The motivation for trying to hire new faculty from the top 20 schools is that these candidates (1) have had an excellent academic background in order to be admitted to the Ph.D. programs in these schools (2) have gone through a rigorous academic and research program in these schools (3) have been trained in how the top schools do research and teaching and (4) have an inherently high probability of success because their advisors and their professors from their Ph.D. institutions will help them serve on program committees of conferences, editorships of journals, and receiving professional recognition and awards. Peer evaluation rankings of departments by other department heads and deans are also done by looking at the Ph.D. institutions of the faculty. We will be proactive in our strategy for recruiting instead of being reactive. Specifically, rather than waiting for the resumes and applications to come in, we will invite fresh Ph.D. candidates from the top 20 schools to apply. Members of the search committee will be encouraged to distribute the workload of contacting the faculty from each of the top 20 schools to determine if there are any Ph.D. students graduating in their areas, and then encourage these Ph.D. candidates to apply. Contact will also be made in various professional conferences asking these Ph.D. students from the top 20 universities to apply.

Some of the faculty hiring (about 25% of the hires) may also be made at a senior level (Associate or Full Professors). The advantage of hiring senior faculty is that it gives instant visibility to the College and department, and access to research funding. The disadvantage is that such senior faculty cost a lot of money in salaries and startup costs; hence we can do a very limited number of these hires. Also, we cannot have a probationary period to evaluate the suitability of these senior faculty for UIC in terms of their teaching, research, and service contributions and interest.

We plan to hire three new faculty each year for the next three years and seven in 2010 for a total of 16 new faculty. In addition, we believe we will need to hire three replacement faculty each year due to resignations and retirements for a total of 12 over the next four years. This is a total of 28 new faculty hires over the next four years.

We will develop new policies for faculty allocation across departments developed for guiding new faculty hiring. The faculty allocation will be function of:

1) TEACHING (60%): Undergraduate enrollment by major (15%), Graduate enrollment by major (15%), Course enrollments in undergraduate and graduate courses (30%)
2) RESEARCH (40%): Total research funding by all faculty in department (10%), Average research funding per faculty in department (10%), Average research funding per new faculty in past 5 years (10%), and Ph.D. student graduation (10%)
3) OTHER (5%): Department case for hires, target of opportunity, relevance to interdisciplinary thrust areas, etc.

Promotions and Tenure

Recognizing that the quality of the faculty is the prime ingredient for an outstanding university, the decision to grant promotion and tenure is of critical importance.

For promotion to the rank of Associate Professor with tenure, the individual nominated should have demonstrated his/her scholarship through sustained growth in publications, sponsored research, graduated advisees, teaching effectiveness and faculty governance. There should be a clear perspective that the individual is well on his/her way to national prominence in his/her field. It is a necessary condition that the individual be an effective teacher.

For promotion to the rank of Professor, one should have maintained growth in his/her scholarship through sustained growth in publications, sponsored research, graduate advising, teaching effectiveness and faculty governance. The individual should have achieved international prominence in his/her field. It is a necessary condition that the individual be an effective teacher. Participation in faculty governance and professional organizations is expected. Creating new knowledge, applications of knowledge, and transmission of knowledge are all aspects of scholarship which can be taken into consideration.

We will review our standards for promotions and tenure. Faculty promotions and the granting of tenure are long term investments and absolutely must be done right. We will clearly establish guidelines about what is expected of our faculty during promotion and tenure. The guidelines will specify what is needed in terms of teaching, research, and service at the various levels. We will recognize teaching contributions through student course evaluations, new course development, significant course material enhancements, significant lab renovations, and Ph.D. and MS student thesis instruction and graduation. The research contributions will be based on the quality and quantity of scholarly publications in leading journals and conferences in the field, citation indices of papers, and research funding. The impact of the research contributions will be evaluated by external letters of references. The service contributions will be based on external service on program committees of conferences, editorships of journals, reviewers of NSF and other panels, and internal service based on membership on departmental, college and university committees, and major administrative duties.

The three-year review should be a serious step in the evaluation process for promotion and tenure. If it becomes clear at that juncture that the minimum standards cannot be met, the faculty member could receive a terminal contract in the fourth year.

One of the changes we will institute at the College level is to ask for additional letters of reference on candidates. One way to generate these lists is for the dean to ask the references contacted by the department to suggest the names of three other references. Candidates will be allowed to identify outside referees with whom they have conflicts in the past, and letters will not be requested from these referees. The Dean's office will then request letters of reference from these three individuals. The letters received back by the

Dean's office will be shared with the departments so that they can be used during the decision process of promotions at a departmental level. This will result in promotion and tenure decisions based on fuller evaluative information and will also raise the bar for promotions and tenure in the College of Engineering.

Mentoring

We will review our current policies for mentoring our junior untenured faculty. For each junior faculty (untenured faculty) we will assign at least one mentor at the departmentallevel. The roles of the mentor will be to advise the faculty about how to successfully balance the teaching, research, and service loads of a junior faculty member. The mentor will review research proposals written by the junior faculty, provide feedback about how to improve their research proposals, participate in collaborative research proposals, recommend him/her for membership of conference committees and editorships of journals, and arrange nominations for awards and honors. Incentives will be provided to the mentors for high quality mentoring (as part of the service load of senior faculty members).

Retention

In the future, we will pay attention to retention of key senior faculty. The cost of losing strong senior faculty is large. We will retain our faculty by creating an improved sense of community in the school, by supporting joint research programs, and creating funds for retention of faculty. In addition, we will create four endowed Chairs and 12 Professorships for senior faculty.

External Recognition and Awards

We should increase the number of faculty who have won National and International Awards. We will increase the number of Fellows of their societies (UIC COE has 42Fellows), and increase number of NSF CAREER/PYI/NYI Awardees (UIC has 20 Career award winners). Our goal should be that 75% of our Full Professors become Fellows of their societies, and 50% of the Assistant Professors receive the NSF Career or DOD/DOE Young Investigator awards at the time of promotion to the rank of Associate Professor. We will also nominate faculty to become members of the National Academy of Engineering (NAE).

In addition, we will try to recruit senior faculty at other institutions who are already NAE members to UIC, even with a part time appointment. We will target senior people from industry who may be ready to move from industry into an academic life.

Internal Recognition and Awards

The University of Illinois at Chicago has various programs to recognize the faculty. We will continue to recognize our faculty through these internal awards. Examples of these awards are:

The **Award for Excellence in Teaching** is the premier peer-awarded teaching prize. Recipients are chosen from nominations submitted to a notable review panel.

The **UIC Distinguished Professor Award** was created to recruit and recognize persons who have made significant impact upon their field through scholarship, creativity, and leadership in the highest level.

The **Silver Circle Excellence in Teaching Award** recognizes UIC faculty for outstanding teaching from a student perspective. Each Spring, faculty from across the campus are selected by members of the senior class to receive this award.

Teaching Recognition Program Award: The Council for Excellence in Teaching and Learning presents the Teaching Recognition Program Award to colleagues who have made outstanding contributions to the fulfillment of UIC's teaching mission over the past five years.

University Scholars are nominated by their fellow faculty for outstanding scholarship and are chosen by a distinguished committee of former scholars. Substantial monetary awards generated by private gifts accompany this distinction.

In addition to the UIC level awards, the College of Engineering also has yearly Teaching and Research awards for the faculty.

Salary Raises

We will review salaries of faculty at all levels. We will compare them to other comparable schools. Our benchmark will be similarly ranked schools (ranked 30-60) in US News, and also Big 10 plus schools, and public universities in urban locations. We will try to make our salaries competitive with the market.

We will review our policies for salary increases. Merit raises are to be given based 40% on teaching, 40% on research, and 20% on service contribution. We will recognize teaching contributions through student course evaluations, new course development, significant course material enhancements, significant lab renovations, and Ph.D. and MS student thesis instruction and graduation. The research contributions will be based on the quality and quantity of scholarly publications in leading journals and conferences in the field, citation indices of papers, and research funding. The service contributions will be based on external service on program committees of conferences, editorships of journals,

reviewers of NSF and other panels, and internal service based on membership on departmental, college and university committees, and major administrative duties.

Research and Teaching Awards

We will provide incentives to tenured and tenure track faculty in the College of Engineering for obtaining large research grants. Five levels of awards, Bronze, Silver, Gold, Platinum and Diamond, will be provided to recognize five levels of research grant expenditures.

Any faculty whose total research expenditure on research grants with full overhead is between $100,000 and $200,000 of funding in a particular fiscal year (e.g., FY06: July 1, 2005 to June 30, 2006) will get a Bronze $500 Research Award and a certificate. Any faculty whose research expenditure on research grants with full overhead is between $200,000 and $300,000 of funding in a particular fiscal year will get a Silver $1000 Research Award and a certificate. Any faculty whose research expenditure on research grants with full overhead is between $300,000 and $400,000 of funding in a particular fiscal year will get a Gold $1,500 Research Award and a certificate. Any faculty whose research expenditure on research grants with full overhead is between $400,000 and $500,000 of funding in a particular fiscal year will get a Diamond $2000 Research Award and a certificate. Any faculty whose research expenditure on research grants with full overhead is more than $500,000 of funding in a particular fiscal year will get a maximum Platinum $2,500 Research Award and a certificate.

We recognize that some research grants in the university have full overhead, while other grants have zero or very little overhead. We wish to recognize faculty who bring in both forms of research grants (because they both contribute to the research program at UIC); however, we will recognize the grants with less than full overhead with less credit since they generate less overhead to the College which can be invested for new initiatives in the College. Any faculty whose research expenditure on research grants with less than full overhead will get 50% credit on their grant expenditures. For example, if a faculty member has a grant expenditure of $75,000 on a grant with full overhead, and $50,000 on a grant with zero overhead, s/he will get credit for $75,000 + 50% ($50,000) = $100,000, and will still get a $500 Bronze award.

The award can be either a cash award given to the faculty member or placed in a discretionary gift account of the faculty member according to the faculty member's preference. Grant expenditures for the above will be calculated based on the proportionate share of the intellectual credit as indicated on the Proposal Activity Form (PAF) form. The award will be presented in fall of the following year.

We will also institute some yearly Teaching Awards for all faculty (including full time lecturers, but not adjunct or visiting) of about $500 to recognize faculty who have made outstanding contributions to teaching that particular academic year (fall and spring semester courses). A maximum of five $500 Teaching Awards will be given each year. The Teaching Awards will be based on excellent student evaluations, course enrollments

in the courses where these evaluations are obtained (larger enrollments are more heavily weighted), course levels in the courses where these evaluations are obtained (lower course levels are more heavily weighted), significant curriculum changes (beyond normal yearly course revisions), significant lab upgrades (beyond normal yearly lab upgrades), creation of new courses (at an undergraduate level), etc. Teaching Awards can be repeated for the same faculty members in different years. A Teaching Awards Committee will be appointed by the Dean each year to recommend recipients of the Teaching Awards. Committee members will not be eligible for an award for that year. The award will be presented in fall semester of the following year.

Teaching and Research Loads

We will review teaching and research loads of faculty and make sure that collectively the College of Engineering faculty contribute to the teaching, research, and service missions of the university. The goal of developing uniform college policies for teaching and research loads is to set incentives and policies such that the teaching loads for highly research active faculty are two a year (one a semester), which is the teaching load in the major research universities in engineering.

The teaching load in most departments in the College of Engineering is four classroom courses per year for faculty who have some research activity (some graduate students and some research publications. Faculty who are active in research have reduced loads of three courses per year. Various departments have different buyout policies for reducing the teaching loads. A common model is for faculty to pay 2/9 of their academic year salary for every course reduction. In addition, faculty get course buy-outs for significant administrative loads such as Department Heads, Director of Graduate Studies, Associate Deans, etc.

We have proposed a new uniform college policy which will reduce teaching loads for research active faculty. The normal teaching load in the College of Engineering will be four classroom courses per year for faculty who have some research activity (some graduate students and some research publications). In addition, faculty are also expected to be involved in research instruction with their M.S. and Ph.D. students on an individual basis. Faculty who have no M.S. or Ph.D. students should teach one additional course per semester in exchange for their lack of individual graduate instruction; hence faculty who have no research activities (no graduate students, no publications, no funding) will be expected to teach six classroom courses per year.

Faculty will get course reductions for significant administrative loads. Department Heads and Associate Deans will get two course buyouts, whereas other department administrators such as Director of Graduate Studies will get one course buyout.

Faculty who are active in research (quantified by at least $50,000 of research expenditures per year) will have a reduced load of three courses per year. If a faculty has less than $50,000 of research funding per year, he/she will be allowed to accumulate

his/her research "credits" to spend $75,000 over two years to earn a one course reduction in the second year.

We will allow faculty to buy out of a second course by paying 11% (1/9) of their academic year salary or $10,000, whichever is higher. In order to buy out of a third course, faculty will have to pay 50% of their salary or $50,000, whichever is higher. This nonlinear formula is designed to reduce the teaching loads of research active faculty with teaching only two courses a year. But we also want those faculty to teach courses to our undergraduate and graduate students. Hence this policy will discourage faculty from avoiding all teaching obligations. It should also be noted that course buyouts will not be automatic but subject to the availability of teachers to cover the courses.

It should be noted that even though the teaching loads of these faculty in terms of direct classroom teaching is being reduced to two or three courses, these faculty are expected to be involved in individual teaching of Ph.D. and M.S. students as part of their thesis supervision.

The departments will use the funds that are generated by the course buyouts to hire instructors to teach those courses that were bought out. Instead of appointing adjunct instructors from the outside, we will provide the opportunity to teach one additional course to faculty who have less research activity and are teaching four courses. In exchange for teaching the fifth course, the faculty member will be provided 1/9 of their salary as overcompensation or $8,000, whichever is lower. The difference in funds ($10,000 less $8,000) will be provided to the department for their use. The decision to select which faculty should get the fifth course to teach will be based on the faculty's teaching record in the other four courses in the previous three years. This mechanism will provide incentives for faculty who are not very active in research to improve their teaching skills to be eligible for getting an extra month of compensation in exchange for teaching a fifth course. If a department does not have any volunteers to teach this course from the faculty in the department, then the department will appoint adjunct professors or lecturers. Departments can also choose not to hire a faculty to offer a course, and use the funds to support Teaching Assistants.

Some funding agencies do not allow faculty to buy out a portion of their academic year salary. We will explore the possibility of allowing these faculty a second way to reduce their classroom teaching load by one course a year in exchange for supporting two of their own Ph.D. students at a 25% rate on their research grant for a year (two semesters) to help with the Teaching Assistantship duties (10 hours a week for each of two students) of that department. This will allow a faculty member to support two of his/her own Ph.D. student on his/her research grant (as 25% RAs) while doing research towards a Ph.D. and also helping with TAship (as 25% TAs) duties in the department. Teaching is a valuable part of the educational experience of Ph.D. students since some of them will go on to academic careers. These students may be called Teaching Associates instead of regular Teaching Assistants since they will be performing duties slightly different from a regular Teaching Assistant. The departments may develop special course credits for these students to register for during the semester they are performing Teaching Associate

duties. This option will be available only to faculty members who are already supporting a minimum of three other 50% RAs per year (which translates to about $150,000 research expenditure) before they can use this option. For this to work, let us assume that a professor has support for 4 Research Assistantships and that he has four Ph.D. students. Two of the students will be supported purely by 50% RAships one semester while two others will be supported by 25% RAship and 25% TAship that semester. The latter two students will be available for taking on teaching duties in the home department for 10 hours a week that semester. The following semester (Spring), the two students who were 50% RAs in the previous semester, would be supported by 25% RAship and 25% TAship that semester. These two students will be available for taking on teaching duties in the home department for 10 hours a week that semester. This type of course buyout is only to be used as a last resort. Faculty who have other funds or means to buy out of a course must use those funds rather than supplying the department with a T.A.

Under a third plan, faculty who are extremely active in research (quantified by at least $350,000 of research expenditures per year) will have a reduced load of two courses per year. If a faculty has less than $350,000 of research funding per year, he/she will be allowed to accumulate his/her research "credits" to spend $500,000 over two years to earn a one course reduction in the second year. These faculty will not be eligible for an additional course buyout at 1/9 the salary. For them, to reduce the course load to one, they will have to provide 50% of their academic year salary.

Research Faculty and Lecturers

While tenure track faculty are supposed to balance their teaching, research and service duties, we will hire some faculty into pure research tracks and pure teaching tracks to augment our tenure track faculty.

Some faculty candidates have a large comparative advantage in research over teaching. Such faculty will be moved into purely research lines where their salaries will be generated 100% from research funds. We will create positions such as Research Assistant Professors, Research Associate Professors, and Research Professors. These faculty will be able to supervise M.S. and Ph.D. student theses, and serve on graduate committees. These positions will not be tenured.

Other faculty candidates' comparative advantage lies in teaching over research. Such candidates will be hired and retained as Lecturers. Their teaching loads will be six courses a year, and their salary lines will be covered 100% from state funds.

Resources for New Faculty

We plan to hire about 16 new faculty over the next four years. In addition we will hire 12 replacement faculty. These faculty will require additional laboratory space. In order to support the hiring of 16 new faculty, we will need 48,000 sq. ft. (assuming 3,000 sq. ft.

per new faculty hired). We are planning a new engineering building of approximately 150,000 sq. ft. to support this new strategic plan for growing the College of Engineering.

We will also increase resources for startup funding for new faculty. In addition we will provide support for seed funding of research projects and cost sharing of large collaborative center grants. These additional funds will be provided from the indirect cost returns of research funds.

Diversity of Faculty

Every university should make racial and ethnic diversity a desirable goal. Meaningful association with people of varying backgrounds and cultural histories, as well as contact with international students, adds to the breadth of educational experiences. Diversity serves long-range social goals of diversity and racial accommodation.

Companies that recruit engineers value diversity since their customers respect diversity. Research universities have made diligent efforts to attract and hold students from racial and ethnic minorities. Large public universities such as UIC with their lower tuition rates can promise education and social mobility to students from lower-income families of all kinds. Campuses of research universities are characteristically heterogeneous places, multi-cultural, and multi-ethnic.

It is well known that it is easier to recruit and retain a diverse population of students if you have a diverse faculty since students tend to view them as role models.

We will encourage diversity in our faculty recruiting of women and minorities by providing incentives such as additional positions to departments. Our goal is to maintain 10% minority and women faculty in the college. We will make sure that 15% of our new hires are minority or women. Assuming we will hire 28 new (16 new, and 12 replacement) faculty in the College, we will need to hire four women and minority faculty among our new hires in the next four years.

UIC has an excellent program called Women in Science and Engineering System Transformation Initiative (WISEST) and a program for Underrepresented Faculty Recruiting Program (UFRP). We plan to leverage off these programs to add more diverse faculty to our college.

Specific actions that we will take are to inform the faculty search committees to be actively involved in recruiting women and minorities:

- Discuss potential role of evaluation bias
- Think about implications of position description
- Make multiple short lists using multiple criteria of quality (research grants, publication impact, teaching)
- Consider women and minorities who are ‘underplaced’ (excelling at lower-ranked institutions)
- Widen the range of institutions from which the top candidates are selected

- Revisit applicant pool if no women or minorities are on the final short list
- Engage in active recruiting for a diverse applicant pool
    - Email groups of women in the field
    - Job postings that reach women and minorities
    - Personal contacts with potential candidates – phone calls, scientific meetings
    - Campus Visits
- Invite women for informal visits (seminar presentations) before officially recruiting them
    - Interview more than one woman (Research shows that a woman is much more likely to be selected as the top candidate if she is not the only woman interviewed.)
    - Provide an opportunity for women to talk to another woman — but not the search committee — about gender and climate issues
- Know about UIC support policies & programs
    - Dual Career Hiring
    - Tenure Roll Back
    - Family Medical Leave
    - Campus Childcare
    - Faculty Mentoring
    - Administrative Shadowing
    - WISEST, CRWG, OWA, CCSW

The strategies for adding more diversity to the faculty includes:

- Provide incentives for departments for diversity of faculty
- Set realistic goals for diversity of faculty in engineering; all fields are not alike
- Look at national statistics for faculty candidates in engineering (NSF/NRC Report Doctoral Degrees, 2001)

Increase Funding for Professorships

The College of Engineering has support for about eight Professorships, some of which are provided by the university (UIC Distinguished Professorships which are unfunded honorary titles), and some are provided through endowment funds from our alumni. As part of the 2010 strategic plan, the College will embark on a fund raising plan from our alums and corporate partners. We plan to raise funding for four Endowed Chairs at $2 million each and 12 Professorships at $500,000 each in the College of Engineering.

2.6.2. Goal 2. Increase our Research Enterprise through Interdisciplinary and Collaborative Research

The specific strategic thrusts for 2010 for research are:

- Our faculty (size 114 in 2006 growing to 130 in 2010) should publish 500 journal papers and 500 conference papers per year in prestigious journals and conferences, an average of four journal papers and four conference papers per faculty per year.
- Our faculty should publish their papers in the top-ranked journals and conferences in their fields in order to have high impact.
- Our faculty should transfer technologies to industry by filing invention disclosures and patents
- Our faculty (size 114 in 2006 growing to 130 in 2010) should collectively bring in $40 million in research funding by 2010, with an average of $300,000 per year per faculty
- We will organize the research areas of the College into clusters of interdisciplinary research in the fields of Bio-technology, Nano-technology, Information Technology, and Infrastructure and Energy/Environmental Technology.
- We should submit at least five large interdisciplinary research proposals per year to agencies such as NSF, NIH, and DARPA at a funding level of greater than $1 million per year per project
- We should get at least one large interdisciplinary research project funded per year by agencies such as NSF, NIH, and DARPA at a funding level of greater than $1 million per year per project
- We should graduate 60 Ph.D.s per year at an average of 0.5 Ph.D. per faculty per year.

Action Plan

Increase the Quality of Publications

Our faculty (size 114 in 2006 growing to 130 in 2010) should publish 500 journal papers and 500 conference papers per year in prestigious journals and conferences, an average of four journal papers and four conference papers per faculty per year in high quality journals and conferences. With input from their faculty, each department head will create a target publication list that identifies top-tier journals and conferences, and second ranked journals and conferences, in various research areas. Each year the faculty will be evaluated in terms of how many papers they published in these top journals and conferences. We will encourage our faculty to publish half as many papers in top-tier journals and conferences than twice as many papers in second-tier journals and conferences.

The motivation for this is to have higher quality and higher impact of our published work. In the future, we will start evaluating the impact of research publications by looking at citation indices for the publications on GOOGLE SCHOLAR, CITESEER.COM or ISI Web of Science.

Increasing Research Funding

It is well known that higher ranked universities generate a large amount of research funding per year. UIC College of Engineering has a total research funding of $21 million, but we plan to increase our funding about 14% each year and double our research funding to $40 million by 2010. We will increase our total research funding by several mechanisms:

1. Increasing our faculty size from its current 114 faculty to 130 faculty
2. Increasing the relative number of research active faculty from the current 85 research active faculty to 110 research active faculty
3. Increasing the research funding per faculty
4. Providing incentives to faculty to increase research by reducing teaching loads to two semester courses per year by making it easier to buy out of teaching
5. Providing some small portion of the Indirect Costs generated from research funds back to the Principal Investigators or Yearly Research Awards to the faculty
6. Providing seed funding for new collaborative projects
7. Writing large collaborative research project proposals
8. Exploring a wide range of federal agencies and industries to secure research funding.

Organize Research into Interdisciplinary Centers

One of the key observations that we would like to make is that the size of the College of Engineering matters in terms of its research reputation. It is well known that the top engineering schools are much larger in terms of faculty size, Ph.D. production, research publications, and research funding. For example top ranked MIT has 350 research active faculty, 1400 Ph.D. students, 200 Ph.D. graduates per year, and $241 million in research funding ($685,000 per faculty). Second ranked Stanford has 165 faculty, 825 Ph.D. students, 229 Ph.D. graduates per year, and $120 million in research funding ($730,000 per faculty). Third ranked UIUC has 360 research active faculty, 1500 Ph.D. students, 186 Ph.D. graduates per year, and $213 million in funding ($590,000 per faculty). Fourth ranked Berkeley has 212 research active faculty, 1200 Ph.D. students, 186 Ph.D. graduates per year, and $121 million in funding ($571,000 per faculty). Fifth ranked Georgia Tech has 477 research active faculty, 1900 Ph.D. students, 179 Ph.D. graduates per year, and $187 million in funding ($392,000 per faculty).

In comparison, UIC is quite small, and has 85 research active faculty, 424 Ph.D. students, 35 Ph.D. graduates per year, and $21 million in annual research funding ($240,000 per active research faculty). However, one does not always have to be large to be highly ranked. For example, Caltech has 96 research active faculty, 461 Ph.D. students, 57 Ph.D. graduates per year, and $48 million in funding ($500,000 of funding per faculty). Princeton has 127 faculty, 482 Ph.D. students, 51 Ph.D. graduates per year, and $56

million in funding ($442,000 in research funding per faculty). The key approach to improve in rankings and reputation is through growing selective areas of excellence.

In the future we will organize the research of the College into Centers of interdisciplinary research areas in:

(1) Bio-technology
(2) Materials and Nano-technology
(3) Computing and Information Technology
(4) Infrastructure and Energy/Environmental Technology

Table 2.5 shows how various departments plan to contribute to each of these areas.

Table 2.5. A New Grouping of research area specialties within department into inter-disciplinary clusters.

Interdisciplinary Clusters/ Departments	**Bio-technology**	**Materials and Nano-technology**	**Computing and Information Technology**	**Infrastructure and Energy/Environmental Technologies**
Bioengineering	Neural Engineering, Tissue engineering, Bio-informatics	Nanotech for bio-materials Cell and Tissue Eng. Nanoscaffolds, Integration of manmade nanostructures with biological structures including biomolecules	Bioinformatics, Neural coding	Nanotech bioeffects
Chemical Eng	Biopharmaceuticals, Bioprocess engineering, Bioseparations	Engineered solid and fluid microstructures, Electronic and nanomaterials, Surface science and catalysis	Computational fluid dynamics, Advanced molecular simulation, Advanced process design and optimization	
Computer Science	Bioinformatics; Visualization; Data Mining	Computational Modeling; Design Automation	Networking and Security; Databases/Data Mining; Learning Technologies	Sensor Networks; Intelligent Transportation Systems
Electrical and Comp. Engg.	Biomedical Imaging Biosensors Molecular Electronics	Novel Nanodevices for electronics and optoelectronics, Nanomems and nanofabrication Spintronics and nanomagnetics	VLSI/CAD and computer architectures Signal and image processing including quantum information Parallel and quantum computing	Wireless and Wired Networks Power and Sensor Networks Information Assurance
Civil and Materials		Materials engineering	Computational structures	Infrastructure for bridges, environmental engineering
Mechanical and	Bio-sensors, bio-	Nanofluidics,	Computational fluid	Distributed energy

Industrial Engineering	fluids, bio-mechanics, Bio-tech - self assembly	nanocatalysis, particle/fiber nanostructures, nanoscale transport phenomena, molecular manufacturing, bottom-up manufacturing	dynamics, computational solid mechanics, industrial virtual reality, prognostics and diagnostics, smart sensors	resources, combustion/emissions, plasma processing, heat and mass transfer processes, indoor environmental quality, energy efficient commercial and industrial technologies

The four interdisciplinary thrust areas of the College of Engineering are going to include researchers from other Colleges as shown in Figure 2.1. For example, the Biotechnology area will involve researchers from the Bioengineering department working on neural engineering, and Electrical Engineering department working on biomedical imaging, and Mechanical Engineering working on bio-sensors, and Computer department working on bio-informatics, and the College of Medicine working on Genetics, and the College of Liberal Arts and Sciences on Neurosciences, and the College of Business on biotech company startups. Similarly, the Nanotechnology thrust area would involve researchers from the Electrical Engineering department working on nano-electronics, and Bioengineering department working on nano-bio-medicine, and Mechanical Engineering working on nano-fluidics, and the College of Medicine on nanotechnology to solve cancer, and the College of Liberal Arts and Sciences working on atomic chemistry and solid-state physics.

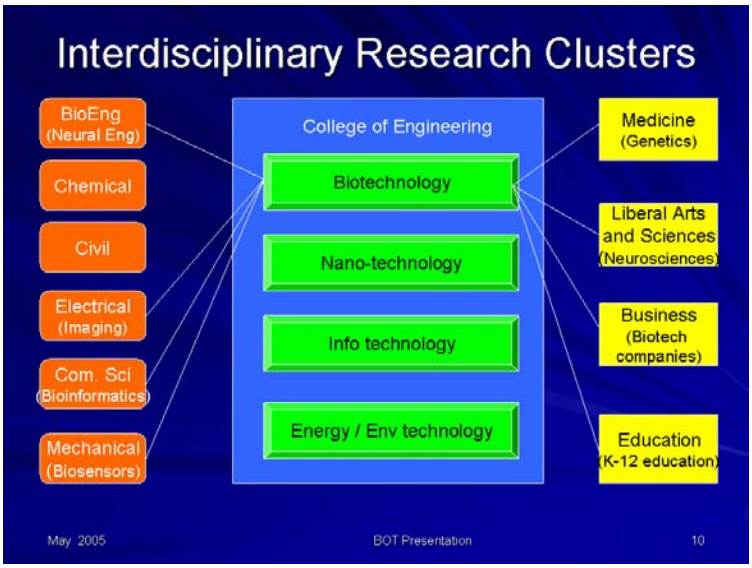

Figure 2.1. Interaction Between the Four Inter-disciplinary Thrust Areas and Other Colleges (example of Biotechnology is shown).

Our strategy will be to develop selective areas of excellence by picking a few areas and developing clusters of faculty working in each area. Each department will develop long term plans for recruiting faculty. We will develop plans to hire faculty in research clusters in order to develop **selective areas of excellence** instead of distributing our

resources thinly to cover all areas. It is very difficult to have impact if in a department of 20 faculty, we have one faculty per sub-area. Instead, if we were to have 4-5 faculty in each cluster, we could have about 3-5 cluster areas per department; it would be easier to have impact (in terms of publications in key journals, publications in key conferences, program committee membership of conferences, editorships of journals, and research funds).

We also believe that a small number of large interdisciplinary research centers and projects are better than a large number of small projects. For example, one $2 million research project is better than five $400,000 individual projects from a visibility point of view. In addition, it is a very good experience for graduate students to be involved in large team projects.

The College of Engineering faculty have already started writing proposals for large collaborative interdisciplinary research centers. The National Science Foundation had its call for proposals for the next round of Engineering Research Centers (ERC) in 2004. Our faculty have submitted five pre-proposals. Each of these proposals involved UIC as the lead institution and up to four other universities as partners.

In addition, various DOD Multi-University Research Initiative (MURI) proposals, NSF Major Research Infrastructure (MRI) and NSF Integrated Graduate Education, Research and Training (IGERT) proposals involving multiple investigators within the College of Engineering are being planned for submission in the 2004-2005 academic year. The College faculty will be encouraged to participate in many more such center grant proposals.

Organizing Inter-Disciplinary Research Group Meetings

We will organize one or two day research retreats in these interdisciplinary areas at UIC. An example of such a one day workshop is a BIO-INFORMATICS Symposium that was organized at UIC in October 2004, where leading researchers from UIC and elsewhere presented their research results in front of UIC faculty and students.

We are planning to have periodic one day research retreats to discuss possible topics of NSF ERC Center or NSF S&T Center proposals at UIC.

We will also host a Distinguished Lecture Series in these interdisciplinary areas where we will invite senior researchers from other universities to come and present their research results to UIC faculty and students.

Seed Funding for New Projects

The College of Engineering will develop plans to fund collaborative projects among faculty in the College of Engineering by having an internal competition for these projects. Funds for these projects will be generated by Indirect Cost Returns on current funded

research projects. By 2008 we will budget $500,000 per year as seed funding of up to 10 projects at $50,000 each per year.

Cost Sharing and Support of Research Staff

As the College faculty are asked to write large collaborative research center grants, the College will commit to cost sharing on these grants. Many funding agencies require 10-20% cost sharing on grants. We are planning to increase our research funding from $21 million to $40 million by 2010. Assuming that half the increase in funding will come from large collaborative center proposals, we will need to bring in $10 million of research funding of this type. Assuming 6% cost sharing on these grants, we will need to pay $6000,000 per year in cost sharing in 2010. This constitutes 1.5% of the $40 million total funds in 2010. We have therefore assumed that we will set aside 1.5% of the funds for cost sharing per year.

One of the ways that the College will help make large collaborative projects successful is to provide support for academic professionals (Research Staff) who can help write large center grant proposals and also manage these projects. The College will hire such technical professionals to help write proposals in interdisciplinary areas such as Bio-technology, Nanotechnology, Information Technology and Infrastructure Technology.

The College will also create faculty positions such as Research Assistant Professors, Research Associate Professors, and Research Professors. These faculty will be able to supervise M.S. and Ph.D. student theses, and serve on graduate committees. These untenured faculty members will support their salaries completely from the research funds. These faculty members will be asked to help write these large collaborative center grants with other faculty in the College.

Larger Startup Funding for New Faculty Hires

In the past, the College of Engineering has been somewhat constrained hiring new faculty due to limited startup funds. The funding mechanism for startup funds was as follows. 33% of the funds came from the departments, 33% came from the College, and 33% came from the Office of the Vice Chancellor for Research. Because the departments did not have substantial funds, this limited the total amount of startup funds that were available to give to new faculty. Startup funds have ranged from $50,000 to $100,000 per faculty.

In the future, we want to provide larger startup funds to attract faculty (an average of $150,000 per faculty). The College will be hiring about 28 new faculty (16 additional and 12 replacement); each department will be asked to develop long run plans for faculty recruiting around such thematic clusters. We will provide startup funds of about $150,000 per new faculty hire. Hence we will need to have a budget of about $900,000 per year for startup funds. These new faculty who are hired will use these startup funds as seed funds to bring ten times as much research funding to the College in the future.

We believe that one needs to invest in research resources to build a large research enterprise. We will pay for these increased funds through increases in our ICR overhead.

Increase the Number of Ph.D. Students

As described in the section of graduate studies and students, our College has 854 graduate students; however, a slight majority of the students are M.S. students. We will increase the number of graduate students to 1,000 (400 M.S. and 600 Ph.D.). We will graduate 60 Ph.D. students per year. We will change the way we invest T.A. and Fellowship resources to increase the number of Ph.D. students in the College. This will lead to a larger research enterprise.

Research Lab Renovation

We will have a budget from the College to renovate some selected research labs of the faculty each year. By 2010, we will budget $750,000 per year towards research lab renovation. Criteria for selecting labs for renovation funding will be established at a future date.

Incentives to the Faculty

We will provide incentives to the faculty for bringing in large research grants. One way is to generate a pool of funds from which yearly Research Awards can be provided to faculty as cash incentives.

Interactions with Industry

We will encourage our faculty to have strong ties to industry. Given that UIC is located in the city of Chicago, one of the advantages that we have over other colleges of engineering is in the ability to have strong ties to industry that are located in the Chicago area. We describe our Corporate Relations strategy in a separate chapter.

Exploring a Variety of Government Funding Agencies

Faculty in the College of Engineering have typically obtained research funding primarily from the National Science Foundation. However, there are many other funding agencies that our faculty should be encouraged to get funding from. They include the National Institutes of Health (NIH), Department of Defense (DOD) agencies such as Office of Naval Research (ONR), Army Research Office (ARO), Air Force Office of Sponsored Research (AFOSR), Defense Advanced Research Projects Agency (DARPA), Department of Energy (DOE) Office of Science, Department of Health and Human Services DHS Office of Science and Technology, and others.

The funding climate in many of these agencies is moving away from traditional isolated areas into interdisciplinary larger collaborative projects. Funding is also moving away from basic research to applied research. The emerging areas of growth in research funding are biotechnology, nanotechnology, information technology, advanced manufacturing, national and international security, and others.

Create some Technology Centers

Given that UIC is located in the heart of Chicago, it may be possible for the College to also create other Technology Centers that could be used as a resource by local companies and government agencies to bring in shorter-term research and development contracts.

The College of Engineering has a very successful Energy Resources Center that employs several professional staff members in the Energy Industry who are engaged in research and development contract work for various agencies. It contributes to about $2 million of research contracts to the College each year.

For example, it may be possible to create an Information Technology Center (providing software and IT support services), or a Networking and Communications Design Center (providing networking and wireless and wired communication services), or an Application Specific Integrated Circuits (ASIC) Design Center (providing ASIC or FPGA design services). Faculty would be associated with these centers, and will work with academic professional research staff members on these technology development contracts. Researchers from industry can visit these centers for 6 months to a year while on leave from their companies. It would be possible for graduate students and undergraduate students in the College to work in these Centers to gain valuable industry relevant experience (almost like co-op or internship experiences) within the UIC campus. We will employ these students as graduate or undergraduate assistants in these Centers but the salaries would be much less than what regular full-time engineers make in the regular workforce. Hence, the cost structure of the research and development contracts performed in the Centers would be much more competitive than regular companies providing these services. Therefore, it may be possible to grow such Technology Centers in the UIC College of Engineering. In fact, companies and agencies in the Chicago area may be willing to “outsource” their projects to these UIC Centers instead of outsourcing them to companies in India, China, and Taiwan.

The Technology Centers would be modeled after other institutes and centers that exist in other universities such as the Information Sciences Institute at the University of Southern California, the GTRI Institute at Georgia Tech, the Applied Physics Lab at Johns Hopkins University, and others.

Increased ICR Funds

Up until June 30, 2005, the College received 36.5% of the ICR funds on research expenditures in the College. Starting July 1, 2005, we have now started receiving an increased ICR return of 50%. This will pay for the startup funds of faculty, cost sharing, seed funds, research labs renovations, and other operational costs.

2.6.3. Goal 3. Improve our Undergraduate Program and Recruit and Retain Excellent Undergraduate Students

The specific strategic thrusts for 2010 for undergraduate programs are:

- Grow the total undergraduate student population of the college from its current 1,550 students in 2006 to 1,900 students in 2010 without lowering our standards for admission.
- Recruit high quality students to the engineering college; specifically, by 2010, we will increase the average ACT score of all incoming freshmen students from 25.8 to 27 and the average Projected Grade Point Average (PGPA) from 25 to of 27
- Provide students with access to an exciting and relevant undergraduate curriculum in engineering.
- Increase the number of B.S. graduates per year from 387 to 450
- Increase graduation rates from 60% to 80% in the college.
- Make sure that average students can graduate in five years if they take a full course load every semester.
- Make sure that diversity is reflected in the student population; ensure that 20% of our students are members of minority groups; ensure that 30% of our students are women.
- Raise funding for 12 additional undergraduate scholarships in the College of Engineering

Action Plan

Increase the number of undergraduate students

The number of students in the College of Engineering peaked at around 1900 students in 2001, and then has been declining ever since to about 1550 students in 2005. One of the reasons for this is that the College made a conscious effort to reduce enrollment around 2002 in order to reduce class sizes while faculty positions were eliminated. This was done by increasing the standards for admission. Another reason for the drop in enrollment of engineering students is the drop in enrollment of students in Chemical Engineering, Computer Engineering and Computer Science. This is actually a national trend. In contrast, enrollments in Bioengineering have been increasing rapidly, while

enrollments in Mechanical and Industrial Engineering and Civil and Materials Engineering have remained steady.

We will make a concerted effort to increase our total number of undergraduate students in the COE from 1,550 students to 1,900 students by 2010. Even though national trends may be to reduce the enrollments in areas such as computer engineering and computer science, the total number of students interested in these disciplines is still very large nationally and in the State of Illinois. We should be able to market our undergraduate programs in these fields to the large population of prospective students in Chicago, the surrounding suburbs, the state of Illinois, and the Midwest.

Improve the quality of our undergraduate students

We will make every effort to recruit very high quality students (in terms of ACT scores and high school ranks) into our College of Engineering by contacting students from Chicago, the suburbs, the State of Illinois, and the Midwest.

All beginning freshmen must have either an ACT or SAT score on file when the admission decision is made. The Office of Admissions will use the highest ACT composite score or SAT total score (from a single test session) that is on file when the admission decision is made. If a student has taken the SAT, verbal and math scores will be added and converted to reflect the ACT equivalent. Admission is based upon Projected GPA (PGPA), also called Selection Index (SI), which is a value obtained from a linear combination of ACT Composite Score and High School Percentile Rank (HSPR).

The PGPA is based upon a regression over five years of HSPRs and ACT scores of admitted Engineering freshmen and their FIRST term UIC GPA. The 2004 Predicted GPA (PGPA) Formula for ENGINEERING freshmen was:

PGPA = 10 x [0.053639 + 0.021039 (HSPR) + 0.038012 (ACT Composite)]

Most recently (2004-05) for Engineering, a PGPA of 27 or more meant an automatic admit by the PGPA algorithm; i.e., it predicted at least a B- average. A PGPA between 19-26 required evaluation of supplemental factors (quality of school, mix of grades, ACT sub-scores, ACT cut-offs); i.e., it predicted a C to B- average. A PGPA of 18 or lower meant an automatic reject by the PGPA algorithm; i.e., it predicted a below C average.

In addition, the absolute minimum ACT score currently accepted is 21 (22 for Electrical Engineering and Computer Engineering, 23 for Computer Science and CSO) when balanced by a better GPA. The 2003 mean ACT score for the College of Engineering was actually 25.8, significantly higher than the university wide average of 23.4. The 2003 average high school percentile ranking was 77.8%.

With respect to admission of transfer students from two-year colleges, a GPA of 2.5 out of 4.0 in Math and Sciences is the minimum GPA for acceptance of transfer students at

the junior level into the College of Engineering. Slightly different criteria apply to international freshmen or transfer students.

The ACT scores (composite and sub-scores) and corresponding percentiles are at the link: http://www.actstudent.org/scores/norms1.html

The relation is nonlinear and the following (ACT Composite, Percentile Rank) combinations are found in the relevant range: (21, 57), (22, 64), (23, 71), (24**,** 77), (25, 82), (26, 86), **(27, 90),** (28, 93), (29, 95), (30, 97).

By 2010, we will target an average ACT score of 27 for all students in the College of Engineering and an average PGPA of 27.

A correspondence between ACT scores and SAT scores is available at the web site:
http://www.collegeboard.com/sat/cbsenior/html/stat00f.html
The corresponding average SAT score target for the College of Engineering would then be 1220 (for ACT of 27). This is a reasonable goal a few years out, but from then onwards, the impact of each point increase in the ACT cut-off will have a substantial impact on the admission pool.

In summary, in the future we will focus on recruiting more students into the college of Engineering **without reducing the admissions standards.** Instead we will gradually increase the standards of admission over the years.

Improve the retention and graduation rate of our undergraduate students

We have observed that only about 60% of our students who enter the College of Engineering actually graduate. Hence 40% of the students transfer to other colleges, or other universities, or simply drop out of school. We need to change this trend by better advising and caring for our students, designing a more efficient curriculum, ensuring that students can take the required courses, and making sure that our students can graduate in four to five years. Our 2010 goal for graduation rates for undergraduate students will be 80%.

Develop better recruiting strategies for freshman students

The UIC College of Engineering admits freshmen and transfer students during the Fall, and transfer students only in Spring. We admit students who are beginning freshmen (directly out of high school) and transfer students (junior standing). Students who left UIC may be considered for readmission in Fall or Spring terms.

We will develop strategies for recruiting high school students into the College of Engineering at UIC. We will target all the Chicago and suburban high schools and meet

with their high school counselors. There are 94 public high schools in the city of Chicago and about 40 suburban public high schools.

Many of the students from the top suburban schools such as New Trier try to get admission into the College of Engineering at UIUC, but UIUC has a quota of about 30 students per high school. There are about 750 other smart students from each of these high schools that we can target.

We will have our faculty and staff visit the students in these schools and convince them to apply to UIC. We will encourage all faculty in the College of Engineering (about 114 faculty) to spend a cumulative of one day a year (two visits of ½ day each) to visit at least one high school in the Chicago and suburban area once a year. The school can be in their neighborhood or close by. The College will develop a matrix of schools to be targeted and match a faculty to at least one school.

We will develop marketing brochures targeted to the high school students. Our marketing brochure will have a brief introduction to our college and our six departments. Our web page will have specific links targeted to encourage the students to apply. We will develop some benchmarking metrics and compare UIC with UIUC, Northwestern, Illinois Institute of Technology, Purdue, University of Iowa, Iowa State, Indiana, Notre Dame, Wisconsin, Michigan, Michigan State, Loyola, De Paul, Northern Illinois University, and others. We will list quality metrics such as number of courses available, class sizes, ratios of students to faculty, quality of faculty, and also provide a detailed analysis of the tuition and other costs. We will show the students that UIC is a very good alternative to the Big Ten schools for a high quality engineering education with small class sizes at an affordable price.

We will also develop high school visiting days at UIC. We will have EXPOS during which students and their parents will visit UIC COE. We will coordinate our recruiting activities with the campus recruiting.

Develop better recruiting strategies for transfer students

We will develop strategies for recruiting transfer students from two year community colleges (such as Oakton Community College and College of DuPage) and universities (such as UIUC and Chicago State) into the College of Engineering at UIC. We will target all the Chicago area and suburban community colleges and meet with their College Counselors.

We will have our faculty and staff visit the students in these community colleges and convince them to apply to UIC. We will encourage all faculty in the College of Engineering (about 114 faculty) to spend one day a year visiting at least one Community College in the Chicago area. They can visit a college in their neighborhood or close by.

We will develop marketing brochures targeted to transfer students. Our web page will have specific links targeted to encourage the transfer students to apply.

Develop better recruiting strategies for transfer students from other Colleges within UIC

We will develop strategies for recruiting transfer students from other colleges within UIC such as Liberal Arts and Sciences, which has a large undergraduate population. We will make it easier for good UIC students who have demonstrated strong interest in engineering to transfer earlier instead of waiting for two or more years before they can move into Engineering. We will evaluate significant recent improvements in performance in math and science courses if such UIC students are slightly under the requirement of transfer GPA of 2.5 or higher at the time of transfer to engineering. Typically, an engineering junior must have completed prescribed math and science courses in order to start taking classes in the major. Engineering minors will also be marketed more aggressively. We will organize Engineering Open Houses twice a year.

Develop exciting and streamlined undergraduate curriculum

Many of the current students complain that they cannot complete their graduation requirements in engineering in four years. This is due to the fact that we have a large number of required courses, a large number of courses that are dependent on one another in the form of pre-requisites, and the fact that not all courses are offered in every semester and every year.

In the future, we will develop a more flexible curriculum by reducing the number of required courses, and also by reducing the number of dependencies of course pre-requisites. We will offer all the required courses every year and announce the offering of courses at least a year in advance to allow the students to plan when to take these courses.

Offer Courses More Efficiently

We will review our courses and enrollment in our current curriculum and make sure that our classes are run at optimum efficiency. We have noticed that many course are offered with enrollments of less than 10 or 15 students. We note that the fixed cost of offering a course is quite high (paying the salary of the instructor and having a classroom). We will see if it is possible to consolidate courses in the curriculum so that the curriculum is not spread over too many courses. This will make sure that most of the courses are offered at close to full capacity (of about 30-50 students).

We will also see if it is possible to remove many required courses in the curriculum and instead provide the students with choices of elective courses. This will solve two problems. First, it will reduce the need to offer certain courses every semester because they are required courses even though the courses may each have only five students. Secondly, it will allow students to graduate within four years.

Finally, we will allow flexibility with elective courses from a rich offering of courses from multiple departments.

We may also ask a faculty member from a less loaded department to teach courses in another department with higher teaching loads. We will make sure that the courses are in an area of expertise of the faculty.

Earlier, we have discussed reducing the teaching loads of research active faculty to two courses. This can be accomplished only if the total number of courses offered per department is reduced to more accurately reflect the teaching capabilities of these faculty. Let us assume that owing to our new policies for teaching and research loads, the highly research active faculty teach two courses, the moderately research active faculty teach three courses, and the remaining teach four courses.

We will review how such a curriculum should be designed purely by looking at the faculty and student counts. Other issues that are pedagogical in nature need to be looked at. The key observation is that we will develop a curriculum so that our courses are not too specialized that only a few students would be interested in taking these courses.

Develop freshman courses in engineering

We will develop freshman courses such as "Introduction to Electrical and Computer Engineering" and "Introduction to Chemical Engineering" to excite students about the field of engineering. These courses will be taught by our engineering faculty and will have strong lab and project components.

Develop design and communication courses in engineering

Future engineering students will need to have excellent design and communication skills. We have a senior capstone design course in the engineering curriculum in most of the departments. In the future, we will integrate design and communication courses throughout the engineering curriculum. We will make sure our students are well versed in design skills and oral and written communication skills. We will develop a curriculum that will educate students to be adaptable and flexible.

Involve undergraduate students in research

We will introduce our undergraduate students to research in all majors, not in just a few majors as is the case now. Research prepares students to be innovative thinkers, and also helps them develop oral and written communication skills. We will also expose students to interdisciplinary research areas such as biotechnology, nano-technology, information technology and infrastructure technology.

One way to involve undergraduate students in research is through the Research Experience for Undergraduates (REU) program from the National Science Foundation.

The College of Engineering has already received several REU grants in the past. Specifically, during 2004, the College of Engineering has submitted an REU proposal entitled "REU Site for Novel Materials and Processing in Chemical and Biochemical Engineering."

Develop exciting instructional labs

We will develop exciting labs for our undergrads. Often times, students get turned off in engineering by having a poorly equipped lab. We will eliminate such boring labs. Our motto will be "Good labs or no labs at all." We will approach various companies to donate equipment to us for our engineering labs. We will also replace some hardware labs with computer based simulation and visualization labs. We will build on the Electronic Visualization Laboratory's technology and expertise to build labs for engineers.

Develop Student Internship and Career Placement Opportunities

Until recently, students who graduated from the UIC College of Engineering had to find jobs on their own using the UIC Career Services Office. In the future, we will create an Office of student career placement, internship and co-op program within the College of Engineering. The objective of this office will be to proactively place our College of Engineering undergraduate students in the top 50 engineering companies in the country for their permanent employment after graduation. We will also provide students with the opportunity for co-op programs and internships in these companies during summer.

Increase Funding for Undergraduate Scholarships

The College of Engineering has support for about 20 undergraduate scholarships some of which are provided by the university, and some are provided through support from our alumni. As part of the 2010 strategic plan, the College will embark on a fund raising plan from our alums and corporate partners. We plan to raise funding for 12 additional undergraduate scholarships at $150,000 each in the College of Engineering. We discuss our fund raising plans in a separate chapter on Corporate and Alumni Relations.

Diversity of the student body

We will make sure that we have a diverse student body by recruiting more women and minority students (specifically African American, Latino, and American Indian students) into the college. While Blacks and Latinos consist of 25% of the US population, only 14% of the students who enroll in engineering are from these communities, and only 11% of those who graduate with an engineering degree are from these communities. At UIC, we are proud to have 20% of our students in the College of Engineering belong to these under-represented minorities. The College of Engineering has a very successful Minority

Recruitment and Retention Program (MERRP). We now describe some of the initiatives that are taken by the MERRP program to improve the diversity of our student body.

Academically talented students from the Chicago area are recruited through pre-college summer events. Each program emphasizes some aspect of engineering such as mathematics, physics, and digital design. The programs are:

Over the past 4-5 years, MERRP has developed professional relationships with various high schools that educate students with ACT scores at 20 or above. Programs are designed to encourage these students to enroll in UIC. Staff, students, and alumni visit high schools to educate students, teachers, and parents about the engineering profession.

A matriculation agreement exists between UIC, IIT, and Chicago State University. Funds are provided by the State of Illinois to assist students from Chicago State transferring to our institution.

Supplemental instruction (SI) is offered throughout the academic year in mathematics, physics, chemistry, and some engineering courses to support students' academic needs and promote group-studying activities. SI is a companion course to Engineering 189 Orientation. Students who are enrolled in the orientation are clustered in math and science courses through their participation in 189.

Efforts are in place to assist students in learning more about the field of engineering through Corporate Shadowing programs. The Minority Engineering Advisory Board plays an active role in this activity. Seeing that there are very few ethnic minorities or females working in the engineering professoriate, this program is especially beneficial to MERRP students who are typically first generation college students and lack sufficient role models. Corporations provide opportunities for our students to interact with professionals from similar gender and ethnic backgrounds.

Other programs will be used as vehicles to enhance a student's smooth introduction to the campus. Because UIC is largely a commuter institution, our orientation program and mentoring activities are designed to respond to the students' holistic needs.

Through our Minority Engineering Advisory Board, national corporations and not-for-profit organizations assist in many program efforts to support students academic and professional society needs through fundraisers.

2.6.4. Goal 4. Improve our Graduate Program and Recruit and Retain Excellent Graduate Students

The specific strategic thrusts for 2010 for graduate programs are:

- Increase the total number of graduate students from 854 students to 1000 students
- Change the mix of students in favor of more Ph.D. students than M.S. students
- Target M.S. enrollment at 400

- Target Ph.D. enrollment at 600
- Ensure that M.S. students can graduate in two years if they take a full course load every semester
- Ensure that Ph.D. students can graduate in five years if they take a full course load every semester
- Increase M.S. graduation rates to 80% in the college
- Increase Ph.D. graduation rates to 75% in the college
- Limit the number of M.S. graduates per year to 200
- Increase the number of Ph.D. graduates per year from 41 to 60
- Recruit high quality Ph.D. students with an average GRE score of 770/800 in quantitative, average score of 600/800 in verbal, and average score of 730/800 in analytical (suitably adjusted for the new analytical writing test with a scale from 0 to 6).
- Provide students with access to an exciting, relevant and interdisciplinary graduate curriculum in engineering
- Ensure that diversity is reflected in the student population. Ensure that 10% of our graduate students are minority; Ensure that 20% of our graduate students are women
- Raise funding for 12 additional graduate fellowships in the College of Engineering.

Action Plan

Increase number of Ph.D. students

The total graduate population had peaked at around 1000 students in 2002, but has since gone down to 854 students. While in the past, there were relatively more M.S. students than Ph.D. students by a factor of about 2:1, recently the ratio has become more like 1:1.

We will increase the total number of graduate students to 1000 students and also change the relative mix of students in favor of more Ph.D. students. Specifically, we will target a total M.S. enrollment at 400, and total Ph.D. enrollment at 600. We will do this by a variety of strategies that are described in later sections.

Improve the Quality of our Ph.D. students

We will make every effort to recruit better quality graduate students (in terms of GRE scores, quality of undergraduate institutions, and GPAs from their undergraduate institution) into our College of Engineering.

We will recruit high quality Ph.D. students with an average score of 770/800 in quantitative, average score of 600/800 in verbal, and average score of 730/800 in analytical. GRE has recently changed the analytical test scores from a scale of 800 to a scale of 6.0. We will suitably adjust the score of 730/800 for analytical to the new 6

point scale. In comparison, our current average total GRE scores are 1900, with an average scores of 744 in quantitative, 671 in analytical, and 550 in verbal.

We will try to recruit the very best students from universities in the State of Illinois (UIUC, UIC, IIT, Northwestern), universities in the Midwest (Purdue, Michigan, Michigan State, Iowa, Iowa State, Wisconsin, Notre Dame) and the top international universities from China (Tsinghua University, Beijing University), India (Indian Institute of Technology, Birla Institute of Technology, Indian Institute of Science), Taiwan (National Taiwan University), Korea (Seoul National University), Europe, Canada and South America.

We will improve our recruiting of graduate students by developing printed marketing brochures from each department and also by creating an exciting web page at the college and departmental level and highlighting the excellent research that is being done at UIC. We will publish an annual research report from the college that will describe the research activities (funding, publications and Ph.D. and MS student graduation data) of the entire college. We will encourage our faculty to visit the above universities and give research talks each year. As part of their talks, they will be encouraged to give a 2-3 slide overview of the graduate studies and research programs available at UIC in their departments. Contacts will be made by the Dean's office to the various international universities, asking students from these schools to apply to UIC.

We will also try to recruit our undergraduates from UIC to pursue a Ph.D. at UIC. We will do this by encouraging our undergraduates to do research with our faculty and graduate students during their undergraduate programs. One of the ways to do this is to have NSF sponsored Research Experience for Undergraduates (REU) programs.

In addition, we will recruit excellent Ph.D. students by making offers for four-year support instead of one-year support. In addition, we will try to increase the monthly stipends that are paid to our Ph.D. students by making them more competitive with other universities. We discuss the financial support in the section 5.3.3.

We will also recruit students to our direct Ph.D. program by better marketing the advantages of this program. We discuss the direct Ph.D. program in the following section.

Financial Support of Ph.D. students

Graduate students (M.S. and Ph.D.) in the College of Engineering are currently supported through one of the following means:

1. Some students are supported as a 50% Teaching Assistant for help with teaching undergraduate students, discussion sections, grading, and supervising labs. There are about 92 TA positions in the college that are distributed among various departments. These students get a monthly stipend of about $1,500 per month plus a full tuition waiver. In addition, all students in engineering have to pay a

differential tuition of $1,734 per year. The tuition waiver only applies to the basic tuition, and not for the differential tuition.

2. Some students are supported as Fellows; there are about 12 fellowships that are provided by the Graduate College of the university each year to first year and final year students based on a university wide competition. These students get a monthly stipend of about $1500 per month plus a full tuition waiver but not the differential tuition. .
3. Some students are supported by 50% Research Assistantships for doing work that is related to their M.S. or Ph.D. theses. These RAships are provided by the individual professors' research grants based on how much research funding is brought into the college each year. During 2004 there were about 300 students that were supported as RAs. These students get a monthly stipend of about $1,500 per month plus a full tuition waiver. However, a tuition remission charge of 37% of the stipends is directly charged to these research grants. Also, the tuition waiver for RAs only applies to the basic tuition, and not for the differential tuition.
4. Some students are supported as 50% Graduate Assistants for doing miscellaneous work for various units on campus (such as the Medical School or the Campus Computing office) that are not related to their thesis. These students get a monthly stipend of about $1,500 per month plus a full tuition waiver but not the differential tuition. The differential tuition of $1,734 per year is paid by the students. There are about 100 students who are supported as Graduate Assistants.
5. There are some students who are not supported by any TA, RA, GA, or Fellowship. They pay for their living expenses on their own. However, the College gets about 35 Tuition and Fee Waivers (TFW) from the campus. These students have to pay the differential tuition of $1,734.
6. There are some students who are self-supporting or company supported where the living expenses, tuition expenses, and differential tuition are all paid by the students.

In the past, Teaching Assistantships, Fellowships, Graduate Assistantships, Research Assistantships, and TFWs have been awarded to both M.S. and Ph.D**.** students.

We have recently changed the support policies for graduate students as follows. The College will admit graduate students with TAships and Fellowships only if they are declared Ph.D. students. Students who are declared to be terminal M.S. students would not be supported by TAships and Fellowships. In addition, we provide offers for Ph.D. students for guaranteed support for five years. However, all five years of Ph.D. study should not be supported by teaching assistantships or a Fellowship. The majority of years of Ph.D. study should be supported by research assistantships.

The College has 92 T.A. positions and about 15 Fellowships. We plan to increase this number to about 106 TAs and 30 Fellowships. If all T.A. and Fellow positions were offered to **first year Ph.D. students only**, we could admit 130 new Ph.D. students to the College each year, provided we promise to support them with Research Assistantships in the 2^{nd}, 3^{rd}, 4^{th} and 5^{th} years. This would produce a total number of Ph.D. graduates of

about 110 Ph.D.s per year from the college. If all T.A. positions were offered to **first and second year Ph.D. students**, we could admit 65 new Ph.D. students to the College each year, provided we promise to support them with Research Assistantships in the 3rd, 4th and 5th years. This would produce a total number of Ph.D. graduates of about 60 Ph.D.s per year from the College. Starting Fall 2005, we have changed our policy to provide TAships and Fellowships to first and second year Ph.D. students only. Subsequently we will change the policies to support only first year students as our faculty get more research grants (from $21 million to $40 million as explained in the Research section). This strategy will result in a target Ph.D. graduation rate of about 60 Ph.D.s per year by 2010, and eventually about 100 Ph.D. per year by 2015.

This revised policy for supporting graduate students would imply a resource allocation policy where TAships would be allocated to Ph.D. students who are advised by faculty who have the capability of continuing to support these students in the future through research assistantships.

The above model of providing "matching support" of three years of research assistantship funding by two years of teaching assistantship funding from the College of Engineering will be subject to some flexibility. Instead of supporting Ph.D. students in the first and second years, we may also support the Ph.D. students in the first and fifth years of their Ph.D. as a Teaching Assistant, if that works to the benefit of the faculty and the departments in terms of better managing the research funds.

Another flexibility we will provide is that of providing TA support for faculty who are new to the College. Faculty get startup funding to support some graduate students. We will allow these faculty to support their students in the first year as TAs before moving them to RA funding using their startup funds in the second year.

In the past, the model for TA allocation was based only on undergraduate student enrollment in various departments. We have recently changed the policy to base our TAship allocation on a combination of undergraduate enrollment, course enrollment and need and ability to fund Ph.D. students in each department using RAships, and the number of Ph.D. students graduated by a department.

It should be noted that these are college guidelines, and we will allow departments some flexibility to allocate no more than 10% of TA resources for outstanding domestic M.S. students who we believe have the potential to convert into Ph.D. students.

This change in policy should increase the number of serious Ph.D. students in the College and the Ph.D. graduation numbers. It should not prevent the enrollment of M.S. only students. It simply means we will not fund them with a TA or Fellowship or TFW. They can continue to be funded as Graduate Assistants in other units on campus, or self-funded, or be supported as an RA by some faculty members.

Improve the Retention and Graduation Rate of our Ph.D. students

We have noticed that in the past even though we have had a large number of Ph.D. students (about 424 in AY 2006), only 41 Ph.D. students graduated. Hence many of the Ph.D. students come to UIC and leave without a Ph.D. About 75% of the Ph.D. students never complete their Ph.D. degree, but instead graduate with a M.S. degree, and take a job at some company. Many others transfer to other universities, or simply drop out of school.

We have recently changed the policy for Ph.D. student support in the College. Every department has developed a direct Ph.D. program in which students would go from a B.S. to a Ph.D. If a student does not complete a Ph.D. degree in the College of Engineering at UIC, the student will not be awarded an M.S. degree in Engineering from UIC unless the student explicitly petitions to transfer to the M.S. program and that petition is approved.

Develop Exciting and Streamlined Graduate Curriculum

Many of the current students complain that they cannot complete their Ph.D. graduation requirements in engineering in five years. This is due to the fact that not all required courses are offered in every semester and every year. We also have very difficult Ph.D. qualifying exams in certain departments. We need to change this trend by better advising of our students, reducing the number of required courses, offering required courses more regularly, easing the requirements for the Ph.D. qualifying exam, and making sure that our Ph.D. students can graduate in five years.

In the future, we will develop a more flexible curriculum by reducing the number of required courses, and also by reducing the number of dependencies of course pre-requisites. We will offer all the required courses every year and announce the offering of courses at least a year in advance to allow the students to plan when to take these courses.

Offer Courses More Efficiently

We will review our courses and enrollment in our current M.S. and Ph.D. curriculum and make sure that our classes are run at optimum efficiency. We have noticed that many graduate courses are offered with enrollments of less than five students. Because of these low enrollments, classes are often cancelled. Hence many of the students cannot graduate since some of the required courses are not offered.

In the future, we will change this situation, by noting that the fixed cost of offering a course is quite high (paying the salary of the instructor and having a classroom). We will study if it is possible to consolidate courses in the curriculum so that the Ph.D. and M.S. curriculum is not spread over too many courses. This will make sure that most of the graduate courses are offered at close to full capacity (of about 15-20 students for graduate courses) so that there will be no need to cancel any courses. We will also see if it is

possible to remove many required courses in the curriculum and instead provide the students with choices of elective courses. This will solve two problems. First, it will reduce the need to offer courses every semester because they are required courses even though the course may have only five students. Secondly, it will allow our Ph.D. students to graduate within five years Finally, we will allow flexibility in the elective courses from a rich offering of courses from multiple departments.

Develop New Uniform Policies for Allocating Teaching Assistants (TA)

Departments will be provided more Teaching Assistant (TA) resources based on the following factors: 60% undergrad teaching, 40% research support that will be broken down as follows:

- Undergraduate course enrollments (35%)
- Total undergrad enrollments (25%)
- Research assistantship support by various departments (25%)
- PhD students graduated (15%)

Develop Student Internship and Placement Opportunities

We will create an office of student career placement, internship and co-op program within the College of Engineering. We will make pro-active efforts to place our graduate students in the top 50 engineering companies and universities.

Diversity in the Student Body

We will make sure that we have a diverse student body by recruiting more women and minority students (specifically African American, Latino, and American Indian students) into the graduate programs.

We will ensure that 10% of our graduate students are minority, and we will also ensure that 20% of our graduate students are women We will maintain this diversity by having scholarships and fellowships for minorities and women engineers. We report on these activities in a separate chapter.

Increase Funding for Graduate Fellowships

The College of Engineering has support for about 15 Graduate Fellowships, some of which are provided by the Graduate College, and some are provided through our alumni. As part of the 2010 strategic 2010 plan, the College will embark on a fund raising plan from our alums and corporate partners. We plan to raise funding for 12 additional graduate fellowships in the College of Engineering.

2.6.5. Goal 5. Develop Professional and International Programs

The specific strategic thrusts for 2010 for professional and international programs are:

- Deemphasize the current Master's of Engineering (MENG) program with internet courses
- Focus the energy on developing Professional Masters Programs with live instruction
- Master's in Bio-technology, Information Technology, Energy Technology
- Have at least 60 students in each program over two years
- Focus on strong international programs with a select set of universities
- Make the programs financially profitable

Action

International Master's Program

The UIC College of Engineering has signed a large number of agreements with foreign universities. Presently, vigorous programs exist with the Polytechnics of Milan and Turin. The agreement with the Politecnico di Torino involves students from the Politecnico who apply and are admitted to the M.S. degree program in Electrical and Computer Engineering, or in Mechanical Engineering, and who take courses toward their UIC degree at Torino. The courses are taught in English according to the UIC Graduate Catalog by Adjunct Professors hired and paid by our COE. The students come to Chicago to defend their MS thesis in front of a committee whose Chairperson and the majority of members are from the COE. Students pay resident tuition and the general fee only, by special permission of the Chancellor, and the tuition is refunded to the COE. A similar agreement is in effect with the Politecnico di Milano for students who pursue the MS degree in Computer Science. However, those students are required to spend one semester in residence at UIC. We plan to continue these programs.

Professional Master's Programs with Live Instruction

Because UIC is located in the heart of Chicago, we believe that there is a large market for a Professional Master's program for professionals who work in industries in Chicago and the neighboring areas, e.g., Motorola, Lucent, Tellabs, Baxter, Abbott Labs, Argonne National Lab, Boeing, Caterpillar, etc. Many of these people would be willing to further their education through a Master's Program.

We believe that the real future of the UIC Professional Master's Program is with live instruction provided by the UIC COE faculty; however, these courses are offered in the evenings on weekdays or on Saturdays. Professionals in the Chicago area cannot be expected to come to the UIC campus in the middle of a weekday and take a one-hour

class. Even though some of these professionals may be enrolling in the MENG program using the internet, we believe that the internet allows professionals who are located in remote locations to take courses from universities that are not close by. If a professional in Chicago wants to take an internet course in engineering, he/she can take the course from a university anywhere in the world. There is no incentive for a resident of Chicago to take an internet course from University of Illinois at Chicago. Examples of universities who have strong internet based courses and curriculum include the University of Phoenix and Stevens Institute of Technology. Internet based courses and curriculum can be successful but it is much harder and expensive to develop these courses properly. According to some surveys, it can take about $500,000 to develop the course material for a very well developed engineering course.

Several top ranked engineering schools have strong professional Master's programs; examples include Stanford University and Johns Hopkins University nationally. In the Chicago area, Northwestern University and Illinois Institute of Technology offer professional Master's Programs. However, the tuition costs of these professional Masters programs are very high, of the order of $30,000 per year, costing $60,000 over two years. The UIC College of Engineering can develop a very successful professional Master's program by offering exceptional value at a reasonable price (about $12,000).

However, it should be noted that we cannot simply extend our normal M.S. program and courses that are available for our normal graduate students in six departments, namely BioE, ChE, CME, ECE, CS, or MIE. For a professional program to be successful, newer courses have to be developed that are relevant and exciting to current generation professionals, and are not as intensive in deep mathematical analysis, or as extensive in homework, laboratories, or programming assignments. Instead these courses should provide broad overviews of relevant topics using the format of tutorials at professional conferences.

It should also be noted that such a program is more than attending a couple of evening classes. Students form a community as well as a Master's class; they work on group projects together, have meals and breaks together, have social events with program faculty, and graduate together at the end of the program.

We will develop professional Master's curricula in various departments. These degrees can be called Masters in Computing and Information Technology, Masters in Biotechnology, Masters in Nanotechnology, Masters in Infrastructure/ Environmental Technology. Separate committees will be appointed on each proposed topic.

A general format for such a Master's program will be to require eight courses. Students would take two courses during each semester, and complete their Masters degree in two years. Alternately, they can take one course a semester, and finish their Master's degree in four years. Instead of providing students with a wide range of elective courses, the Master's program will consist of a limited set of about 12 courses, from which students select eight.

About two of these courses could have business content, in areas such as business plan writing, entrepreneurship, accounting and finance, marketing and sales. These business courses can be offered by faculty in the College of Business Administration.

These professional engineering courses will be taught by UIC College of Engineering faculty who will be provided extra compensation (e.g., $10,000 per course). There will be no Teaching Assistants provided for any of these courses. Hence the cost for offering the courses will be limited to the faculty compensation.

2.6.6. Goal 6. Cultivate and Promote Corporate and Alumni Relations

The specific strategic thrusts for 2010 for corporate and alumni relations are:
• Create an integrated office of Corporate Relations and Student Career Services
•Work with the UIC Career Services office to ensure program consistency and leveraging of tools and activities.
• Target employment of UIC engineering students in top companies
• Evolve present Co-op/Internship program to be industry driven and fully Web-based.
• Actively promote Co-op/Internship program to increase participation from 30% to over 90% of qualifying students.
• Increase College of Engineering staff/capacity to support at least a 70% internship/Co-op employment rate of those participating in the program.
• Assist with the career services of undergraduate and graduate engineering students by more effectively bringing industry to UIC. Improve tracking and follow up of graduating students. Provide post graduation career service support to the engineering alumni base.
• Create an Industrial Advisory Board consisting of 24 members from companies, two from government agencies, four Deans of Engineering from other universities, and three Venture Capitalists

Action Plan

In the future we will establish a formal process to interface with industry and government institutions. Our approach involves the following:
• Develop strong relationships with local and midwest companies and government agencies
• Solicit funding to upgrade and support the following areas:
• Research labs
• Instructional labs
• support on-going research
• establish on-campus industry design centers,
• support faculty/graduate student research
• Strengthen our Career services activities by proactively promoting UIC and committing industry to hire a percentage of UIC students.
• Target and strengthen the relationships with senior industry and government leaders (decision makers) by promoting and selling UIC's capabilities; these relationships target the following objectives:
– Advisory Board Involvement
– Campus visits to meet with Dean and faculty

– Speaking engagements
– Hold “Industry Days” for our top three to five industry partners

The new Corporate Relations function will undertake a new vision of excellence by reaching out to business and other entities and providing the necessary services to access the capabilities of the College of Engineering. This will be accomplished by forming partnerships and alliances with corporations and foundations in ways that will benefit these entities and the people they serve. Towards this end, we are in the process of revamping our approach to external relations by addressing the areas of research relations, technology transfer, providing professional interdisciplinary academic development, human technical resource capital, and opening a window to industry to improve corporate involvement on campus. The College of Engineering has declared “Corporate Relations” to be a very strategic part of the 2010 strategy plan. As a result, the Corporate Relations group has developed a multi year plan to grow this very important area. This function has defined the following areas to be key to a successful program. These include:
A. Realignment of the Industrial Advisory Board
B. Corporate support of the College Career Services Program
C. General Industry Relations to support research, funding, and other activities
D. Corporate on-campus involvement

Advisory Board

The future strategic direction of the Advisory Board will be re-aligned to be much more action driven with expanded representation. Future board members will now be expanded to include, in addition to industry, government agencies and academic representatives. Future boards will only meet once a year instead of twice a year. To accomplish this task, the make-up of the present board is being revaluated with the goal of replacing some of the current members with new companies and new members that are much more aligned with the College of Engineering’s strategic direction.

Some of the actions and duties of the new Board will encompass the following:
• Engage senior professionals in UIC strategy development
• Provide external input to improve the curriculum of the college
• Assist in funding
• Assist in career services, Co-op and Internship.

The following duties are defined for each board member:
• Provide feedback to improve curriculum.
• Participate and provide feedback to develop the long-term strategy plan for the College.
• Solicit funding to upgrade and support our research and instructional laboratories, support on-going research, scholarships, and chaired professorships.
• Support the career services process.
• Participate in Industry Days.

Future Composition of new Advisory board:
• Composed of industry, government, and academia

• Industry – **24 seats**
• Government Agencies – **two seats**
• City of Chicago, State of Illinois
• Deans from external Colleges of Engineering– **four seats**
• Venture Capitalist – **three seats**

The future Advisory Board will be much more action driven. One area in which we will expect each member to be more active is the raising of funds to assist with special needs for the college.
• Members of Advisory Board to assist in raising a percentage of our financial goal
• Fund raising by proactively contacting alumni base
• Solicit grants from government agencies and individual contributions
• Increase marketing activities to promote UIC capabilities.

Corporate Relations Support of Career Services Programs

One of the activities that the College of Engineering in emphasizing is the development of a Career Services function that is tightly linked to our corporate partners. Today this activity is not formalized and it is manually driven. With the formation of our new web site, an opportunity is provided to fully automate this process.

Career Services Goals:
• Qualified students completing an internship or co-op today are less than 15% of the number of qualified students; the goal is to achieve over 70% internship/co-op completion rate of participating students over four years
• Web based posting of industry openings and student electronic resumes on-line began July 2005
• Proactively engaging industry to allocate a percentage of their Co-op and Internship openings to UIC
• On Campus promotion of COE career services through class presentations, alignment with professional organizations and direct work with faculty.
• Improve tracking of alumni base through graduation surveys and follow-up contact.
• Over 200 companies and government agencies register internship/co-op positions with our office annually; the goal is to increase this number by 50%.

Other Industry Support Programs

Our Corporate Relations function will also seek to engage in very specific and visible strategic programs with companies outside of those participating on the Advisory Board. These programs will emphasize the areas of faculty research and technology transfer. This area will seek to increase funding and revenue to the College of engineering by growing and promoting the value of the technical asset. In addition the college will expand its technical service activities to very specific research areas. Our goal is for the College of Engineering to become an extension of the corporate research arm by having the College work on very specific research activities unique to the industry partner. This in turn will help local companies better manage their R&D budgets and expand their

technical portfolio by partnering with UIC. The College will also organize special events for the industry partner called "Industry Days" where senior executives are invited to our campus to attend very detailed reviews of the research work done by our faculty and also include lab tours to view the latest leading edge work done at UIC.

Corporate On-Campus Involvement

UIC's College of Engineering Office of Industry Relations serves as a central point of contact for corporate involvement on campus in the following areas:
• Participating in state-of-the-art research
• Sponsoring their own research studies
• On-campus speaker engagements
• Arranged College of Engineering tours
• Building relationships with faculty
• Making Proposals to the College of Engineering
• Starting a Matching Gift Program
• Technology transfer
• Arranging Industry Days

2.6.7. Goal 7. Aggressively Improve Marketing and Rankings

The specific strategic thrusts for 2010 for marketing and rankings are:

- Study the rankings of engineering colleges and departments in US News and World Report and evaluate the criteria
- Prepare marketing and communications materials (printed and electronic) for various constituents to improve the reputation of the College.
- Separate materials to be prepared for visitors, various Engineering Deans, various department Chairs across the country, prospective students, current undergraduate and graduate students, parents of current students, various companies, and federal agencies.
- Coordinate the development of a better Web page for the College and the various departments.
- Coordinate the development of various printed materials (Undergraduate Programs, Graduate Programs, Research Report, Alumni Magazine).
- Improve the overall graduate and undergraduate rankings of the College of Engineering of UIC in US News and World Report from the current 59 to 40

Action Plan

Study of Graduate Engineering School Rankings

It is widely known that rankings of engineering colleges are very subjective since they are often times based on perceptions and not hard reality. One ranking that is widely

respected in academia is the ranking performed by the National Research Council (NRC). However, the NRC does its rankings only once every 12 years. It takes into account a large set of criteria such as quality and reputation of faculty, quality and quantity of the research, quality of the educational programs, etc. However, since the rankings are not done very frequently, it is hard for universities to show much change in reputation in the short term.

More recently, the US News and World Reports magazine has started publishing rankings of graduate programs and undergraduate programs in various fields including engineering. While in the past, the rankings were based on only subjective metrics like "reputation ranking by peers", more recently, this ranking has started taking into account quality of graduate students as measured by average GRE scores, the number of Ph.D. students graduating each year, and quality of faculty as measured by percentage of faculty who are members of the National Academy of Engineering, and quantity of research as measured by the total research expenditures per year as well as the research expenditures per faculty per year.

In this 2005 ranking the UIC College of Engineering is ranked 59th out of more than 167 universities that confer engineering degrees. The strategic plan for the college is to see if UIC can move to a rank of 40 in the next five years. It is important to review the reputation of the universities who are ranked 40 through 60, and compare UIC to this list.

Study of Departmental Rankings

In addition to ranking the College of Engineering, the US News and World Report each year also ranks each department in each university. These rankings are done using very subjective metrics, namely that of the perceptions of various Deans and department heads of the reputations of other universities.

Develop Marketing and Communications Materials

The College will prepare various marketing and communications materials (printed and electronic) for various constituents to improve the reputation of the College.

Separate materials are to be prepared for visitors, various Engineering Deans, various department Chairs across the country, prospective students, current undergraduate and graduate students, parents of current students, various companies, and federal agencies.

We will coordinate the development of various printed materials (Undergraduate Programs, Graduate Programs, Research Report, Alumni Magazine).

The marketing strategy will be to have documents relating to the following:

- Why should students pursue Engineering in general?

- Why should students choose UIC for studying Engineering?
- UIC overview (UIC neighborhood perception)
- Message from the Dean (video)
- Career Placement (prominent alumni videos)
- Student Faculty Ratio (photos of faculty teaching)
- Scholarships - Financial Aid
- Programs and Initiatives
- Departments
- Video
- Description of Undergraduate and Graduate programs

Development of a New Web Page

The College will develop and maintain a new and exciting web page for the college and the various departments. The web page will be kept current with current news items and calendar of events on the top. It will have useful links for prospective students and faculty.

2.6.8. Goal 8. Provide Efficient Administration and Staff

The specific strategic thrusts for 2010 for administration and staff are:

- Provide resources to maintain efficient administrative and technical staff in the College of Engineering.
- Increase the total number of staff in the College of Engineering from 71 in FY06 to 75 by 2010.
- Provide competitive salaries for all staff in the College of Engineering to make the UIC salaries competitive with Big Ten Plus salaries.
- Improve the morale and effectiveness among the staff members.

Action Plan

Administrative Staff

We will review whether we have sufficient administrative staff in all departments. We will examine the needs of each department. We will allocate staff resources based on undergraduate and graduate student enrollment, number of faculty, needs of various instructional and research labs in the departments, and total research activities and funding in various departments. We will review salaries of administrative staff at all levels. We will compare their salaries to other comparable schools. An example benchmark will be the Big Ten Plus schools or CIC Institutions. We will review our

policies for salary increases. We will study how we can make the salaries competitive with the market.

Technical Staff

We will review whether we have sufficient technical staff in all departments. We will examine the needs for technical staff in each department. We will allocate staff resources based on undergraduate and graduate student enrollment, number of faculty, needs of various instructional and research labs in the departments, and total research activities and funding in various departments. We will review salaries of technical staff at all levels. We will compare their salaries to salaries in other comparable schools. An example benchmark will be the Big Ten Plus schools or CIC Institutions. We will review our policies for salary increases. We will study how we can make the salaries competitive with the market.

Recognition and Awards

We will review our policy of staff recognition and awards. UIC and the College of Engineering have various staff recognition events. We plan to expand these events in the future.

Improving the Morale and Effectiveness

We will improve the sense of community among the staff members in the College of Engineering. We will communicate the strategic plans for improving the college with all the staff members, and solicit their feedback in making the college run more efficiently.

In addition, the Educational Policy Committee at the college level will deal with all curricular issues at the undergraduate and graduate level.

2.6.9. Stretch Ideas

Recruit Members of the National Academy of Engineering

The College will try to recruit senior faculty members from industry who are members of the National Academy of Engineering. These faculty will be asked to lead large collaborative research centers (discussed in the next item).

Secure Funding for Collaborative Multi-disciplinary Research Centers

The key approach to improve in rankings and reputation is through growing selective areas of excellence.

In the future we will organize the research of the College into Centers of interdisciplinary research areas in:

(1) Bio-technology
(2) Materials and Nano-technology
(3) Computing and Information Technology
(4) Infrastructure and Energy/Environmental Technology

Each year, we will have faculty work together in groups within the college and across other colleges on large collaborative multidisciplinary proposals. We plan to secure the funding for at least one large NSF Engineering Research Center or a Science and Technology Center in the next five years.

Create Technology Centers

The College of Engineering at UIC has decided to create several Technology Centers as part of the Strategic Plan 2010 for the College. Technology Centers will allow the faculty and students in the College of Engineering at UIC to be involved with stronger research ties with industry. Given that UIC is located in the heart of Chicago, it should be possible for the College to create Technology Centers that could be used as a resource by local companies and government agencies to bring in shorter-term research and development contracts. Faculty will be associated with these centers, and will work with academic professional research staff members on these technology development contracts. Researchers from industry can visit these centers for six months to a year while on leave from their companies. It would also be possible for graduate students and undergraduate students in the College to work in these centers to gain valuable industry relevant experience (almost like co-op or internship experiences) within the UIC campus. We will employ these students as graduate or undergraduate assistants in these centers but the salaries would be much less than what regular full-time engineers make in the regular workforce. Hence, the cost structure of the research and development contracts performed in the centers would be much more competitive than regular companies providing these services. It may, therefore, be possible to grow such Technology Centers in the UIC College of Engineering. In fact, companies and agencies in the Chicago area may be willing to "outsource" their projects to these UIC Centers instead of outsourcing them to companies in India or China. The Technology Centers would be modeled after other institutes and centers that exist in other universities such as the Information Sciences Institute at the University of Southern California, the GTRI Institute at Georgia Tech, the Applied Physics Lab at Johns Hopkins University, and others.

Involve Faculty in Applied Projects with Industry on Engineering Problems

Faculty at UIC are allowed to perform one day of consulting per week. But faculty are not allowed to use any UIC resource (labs, computers, software) for their consulting

work. We will explore the notion of forming cluster of faculty for local industry to work on consulting opportunities in the technology area. We can also potentially partner with patent law firms in the Chicago area to consult for companies involved in technology based lawsuits/ We can charge companies $250-300 per hour for the service. Faculty will gets 50%, UIC COE gets 50% of each consulting contract. If we could bring in $2 million worth of consulting services, that would increase the total research grants and contracts expenditures of the College from $21 million to $23 million. It would provide extra income for faculty ($1 million). Faculty can use UIC resources such as computers, labs such as the Nanotechnology Core Facility (NCF) for their experiments. This could generate $1 million extra revenue per year for the College, which is the equivalent of 10 faculty lines.

Organize the College of Engineering into a set of Research Centers and Educational Departments

Engineering College faculty have three primary missions, teaching, research and service. Currently, all their missions are managed under the umbrella of departments where one performs teaching duties, advises undergraduate and graduate students, and performs research. In the future, we will explore the concept of reorganizing the College of Engineering into departments that will be responsible for providing the education to our students (B.S. , M.S. and Ph.D. programs), and into Research Centers that will be responsible for managing research programs. Faculty would have joint appointments in an educational department (teaching) and aa Research Center

Form Partnerships with Chicago area Law Schools

Engineering should be marketed to undergraduate students as a 4-year basic undergraduate education that can prepare them for professional degrees in either medicine or law. We currently have a GPPA program whereby good students get admitted to the B.S. program in engineering with guaranteed admission to a professional program such as the Medical School. This is very attractive to some of our undergraduate students.

UIC does not have a Law School. We will therefore form partnerships with some Chicago area Law School such as the J.D. Marshall Law School or the Kent School of Law where students can get an engineering degree from UIC and a law degree from a Law School in 4+3 years. This will help improve our recruiting of students.

The College will prepare various marketing and communications materials (printed and electronic) for various constituents to improve the reputation of the College.

SECTION 3

RESOURCE PLAN

3.1. RESOURCES NEEDED

3.1.1. HUMAN

We plan to increase our undergraduate student enrollment from 1550 to 1900. Table 3.1. shows the target growth plan of our undergraduate enrollment in six departments and the College of Engineering. We will do this by a variety of strategies that are described earlier. The increase in the enrollment will generate additional revenue to the college to hire additional faculty and teaching assistants.

Table 3.1. Undergraduate student growth plan in College of Engineering.

	AY06	AY07	AY08	AY09	AY10
B.S. students	1550	1650	1750	1850	1900

We plan to increase our graduate enrollment from 854 to 1000. We will increase the total number of graduate students to 1000 students and also change the relative mix of students in favor of more Ph.D. students. Specifically, we will target a total M.S. enrollment at 400, and total Ph.D. enrollment at 600. We will do this by a variety of strategies that are described in later sections. Table 3.2. shows our growth plan in graduate students.

Table 3.2. Graduate student growth plan in College of Engineering.

College grad students	AY06	AY07	AY08	AY09	AY10
MS	430	400	400	400	400
Ph.D.	424	525	550	575	600
TOTAL	854	900	950	975	1000

We plan to increase our faculty from our current number of 114 faculty to 130 by 2010. The faculty hiring plans during 2005 to 2010 are provided in Table 3.3. We plan to hire 16 new faculty over the next four years. In addition, we believe we will need to hire three replacement faculty each year due to resignations and retirements.

Table 3.3. Faculty growth plan in College of Engineering

	FY06	FY07	FY08	FY09	FY10
College Faculty FTE	114	117	120	123	130

We plan to increase our Teaching Assistants from our current number of 92 half time positions to 106 half time positions by 2010

Table 3.4. Teaching Assistant growth plan in College of Engineering

	FY06	FY07	FY08	FY09	FY10
College Faculty FTE	92	96	100	102	106

3.1.2. FINANCIAL

Review of Past Five Year Budget

Table 3.5 shows the budget for the College of Engineering in the past five years. As can be seen, the University of Illinois system has gone through a couple of years of severe budget cuts. The UIC COE has had to absorb budget cuts of about 20% in FY03 and FY04 some of which were offset by tuition increases. In response to these cuts, various faculty, staff, and TA positions had to be eliminated.

It is obvious that the College has a yearly structural budget deficit. Over the past couple of years, this structural deficit has been partially covered by the ICR return to the college. As a result, the College has about a $1.6 million deficit in the ICR account. Clearly this needs to be addressed with a plan to remove the deficit with increased revenues.

Table 3.5. Review of Budget for College of Engineering during 1999 to 2005.

COLLEGE	FY99	FY00	FY01	FY02	FY03	FY04	FY05
% INCREASE IN ORIGINAL BUDGET		5.0%	5.6%	6.3%	-6.3%	-5.8%	12.1%
ORIGINAL STATE BASE BUDGET	14,083,831	14,787,044	15,612,865	16,600,210	15,557,108	14,659,923	16,437,999
REVISED STATE BUDGET (Inc Summer)	14,827,969	15,355,474	16,220,020	17,554,999	16,535,521	16,133,687	17,511,309
STATE ACCT EXPENSE (Inc Summer)	14,983,531	15,873,357	17,103,969	18,375,552	17,059,674	17,015,854	18,008,221
STATE SURPLUS/(OVERDRAFT)	(155,561)	(517,884)	(883,951)	(820,554)	(524,152)	(882,168)	(496,912)
INSTITUTIONAL ACCTS EXP/TRANSFERS	553,727	1,133,737	2,241,645	1,980,362	1,577,224	1,030,511	1,827,845
INDIRECT COST RETURN	764,659	888,116	1,090,707	1,287,250	1,590,607	1,630,995	2,029,092
INSTITUTIONAL ACCTS END BALANCE	1,126,032	880,411	(270,526)	(963,631)	(950,256)	(349,769)	(148,522)
LAB FEES REVENUE						177,760	142,232
LAB FEES CASH BALANCE						255,386	281,290
NCF CASH BALANCE (DEFICIT)	25,925	28,023	33,696	(195,928)	(96,984)	(202,835)	(36,973)
MACHINE SHOP	60,301	45,010	9,415	36,589	42,415	15,591	2,707
NATURAL GAS PROGRAM CASH (DEFICIT)	(481,953)	242,758	(1,436,611)	(717,062)	130,857	(2,000,425)	(2,614,373)
GIFT EXPENDITURES	1,140,053	1,084,281	1,013,302	805,781	1,218,001	1,121,364	1,166,912
GRANT EXPENDITURES	10,460,948	13,434,999	15,431,691	19,776,353	24,048,378	21,130,924	21,120,981
ENROLLMENT	2,828	2,720	2,830	2,909	2,887	2,737	2,549
Undergrad	1,972	1,892	1,934	1,962	1,846	1,783	1,641
Grad (including MENG)	856	828	896	947	1,041	954	908
FACULTY FTE	113.00	110.55	115.38	119.38	116.38	114.09	114.09
ACAD PROF FTE	22.57	26.57	38.82	41.22	39.07	34.89	37.39
STAFF FTE	53.30	50.70	42.60	42.40	42.00	39.75	37.75
TA HEADCOUNT	95.00	124.00	160.00	161.00	135.00	115.00	125.00
RATIOS							
State Budget/Student	4,980	5,436	5,517	5,707	5,389	5,356	6,449
State Budget/Undergrad	7,142	7,816	8,073	8,461	8,427	8,222	10,017
State Budget/Grad	16,453	17,859	17,425	17,529	14,944	15,367	18,104
State Exp/Student	5,298	5,836	6,044	6,317	5,909	6,217	7,065
State Exp/undergrad	7,598	8,390	8,844	9,366	9,241	9,543	10,974
State Exp/Grad	17,504	19,171	19,089	19,404	16,388	17,836	19,833
State Budg/Budgeted Faculty FTE	124,636	133,759	135,317	139,054	133,675	128,494	144,079
State Exp/Budgeted Faculty FTE	132,598	143,585	148,240	153,925	146,586	149,144	157,842
Grant Exp/Budgeted Faculty FTE	92,575	121,529	133,747	165,659	206,637	185,213	185,126
Student/Budgeted Faculty FTE	25.03	24.60	24.53	24.37	24.81	23.99	22.34
Permanent Faculty FTE/Staff & AP	1.49	1.43	1.42	1.43	1.44	1.53	1.52
Students/Staff & AP	37.27	35.20	34.76	34.79	35.61	36.67	33.92
Undergrads/TA	20.76	15.26	12.09	12.19	13.67	15.50	13.13

Financial Plan for Teaching Enterprise

We plan to increase the undergraduate student enrollment from 1550 students to 1900 students. The Provost has discussed returning $2,500 per undergraduate beyond the Fall 2004 enrollment of 1641 students. Hence we plan to get additional revenue of $647,500 from the state owing to this increased enrollment.

In addition, beginning in FY06, the College receives a differential tuition of $1,500 for each engineering undergraduate student and $1,734 per graduate student. The undergraduate differential applies to all students except the academic year ’04 class. Their differential is $920 because under the Illinois Guaranteed Tuition Program they are guaranteed the same tuition rate as when they first enrolled. As these ’04 students graduate the higher tuition differentials will apply to an increasing percentage of our undergraduate students. We plan to generate additional revenue of $986,970 by 2010 from tuition differentials.

Table 3.6. Financial Plan for Teaching.

STATE FUNDS	FY05 (Actual)	FY06	FY07	FY08	FY09	FY10
Faculty FTE	114	114	117	120	123	130
TA FTE	46	46	48	50	51	53
Academic Professionals FTE	37	39	39	40	41	42
Civil Service Staff	36	32	33	33	33	33
Undergrad Enrollment	1,641	1,550	1,650	1,750	1,850	1,900
Graduate Enrollment	861	854	925	950	975	1000
FY05 BASE BUDGET	$16,437,999	$16,437,999	$16,437,999	$16,437,999	$16,437,999	$16,437,999
FY06 Budget Cut 3.1%		-$510,400	-$510,400	-$510,400	-$510,400	-$510,400
ADDITIONS TO BASE						
Increased Enrollment - UG	$0	$0	$22,500	$272,500	$522,500	$647,500
Increased Enrollment - Grad	$0	$0	$115,200	$160,200	$205,200	$250,200
Eng Tuition Differentials	$0	$308,800	$546,819	$715,323	$883,828	$986,970
UFRP Funds	$20,000	$40,000	$60,000	$80,000	$100,000	$120,000
Other	$376,183	$354,757	$224,757	$224,757	$224,757	$224,757
General Tuition Increases	$0	$290,200	$580,400	$870,600	$1,160,800	$1,451,000
TOTAL STATE BASE BUDGET	$16,834,182	$16,921,356	$17,477,275	$18,250,979	$19,024,684	$19,608,026
OTHER REVENUE SOURCES						
Projected Int'l Prgm Tuition	$255,120	$250,000	$250,000	$250,000	$250,000	$250,000
Online Tuition Revenue	$228,727	$380,000	$460,000	$380,000	$300,000	$300,000
Trade ICR funds for state funds		$566,794	$566,794	$566,794	$566,794	$566,794
TOTAL STATE FUNDS	**$17,318,029**	**$18,118,150**	**$18,754,069**	**$19,447,773**	**$20,141,478**	**$20,724,820**
STATE FUND EXPENDITURES						
Permanent Faculty Salaries	$10,923,427	$11,261,971	$11,156,311	$11,690,219	$12,237,474	$12,798,411
New Faculty Hires			$255,000	$255,000	$255,000	$595,000
Faculty Pay Increases (2.5%)			$278,908	$292,255	$305,937	$319,960
Sabbaticals	$0	-$160,135	-$150,000	-$150,000	-$150,000	-$150,000
Summer Salaries - Startup	$96,576	$98,583	$46,778	$0	$0	$0
Summer Sal - Dept Heads	$182,700	$222,043	$227,594	$233,284	$239,116	$245,094
Summer Sal – Other	$171,007	$180,000	$184,500	$189,113	$193,840	$198,686
Temporary Faculty Salaries	$319,248	$319,248	$300,000	$280,000	$260,000	$240,000
Academic Professionals	$1,911,635	$2,029,800	$2,048,133	$2,149,336	$2,253,070	$2,359,396
Academic Prof Pay Inc (2.5%)			$51,203	$53,733	$56,327	$58,985
Teaching Assistants	$1,387,500	$1,387,500	$1,440,000	$1,500,000	$1,530,000	$1,590,000
Other Grad Assistants	$168,249	$168,249	$168,249	$168,249	$168,249	$168,249
Civil Service Staff	$1,547,213	$1,544,331	$1,544,331	$1,621,548	$1,702,625	$1,787,756
Civil Service Union Pay Inc			$77,217	$81,077	$85,131	$89,388
Wages	$154,870	$154,870	$154,870	$154,870	$154,870	$154,870
Total Personnel Costs	$16,862,425	$17,206,460	$17,783,094	$18,518,684	$19,291,639	$20,455,796
Non-Personnel Costs	$952,517	$900,000	$950,000	$975,000	$1,000,000	$1,025,000
TOTAL EXPENDITURES	$17,814,942	$18,106,460	$18,733,094	$19,493,684	$20,291,639	$21,480,796
SURPLUS (DEFICIT)	**-$496,913**	**$11,690**	**$20,975**	**-$45,911**	**-$150,161**	**-$755,976**

Table 3.6 shows the financial plans for the Teaching enterprise of the College of Engineering. We have assumed that the State Budget for the College will remain fixed at $16.4 million (FY05 numbers). We have assumed general tuition revenue increases of about $290,200 per year. (equal to the FY06 tuition increase) Extra revenue will come from increased enrollment over four years of $647,500 from undergraduates, and $250,200 from graduate students, and differential tuition of $986,970. We will use the additional revenue to fund our faculty growth from 114 faculty to 130 faculty, increase the number of staff to 75, and increase the number of TAs from 92 TAs to 106 TAs.

Financial Plan for the Research Enterprise

Table 3.7 shows the financial plan for the Research Enterprise. We plan to increase our research funding 14% each year to double it in five years from $21 million in 2005 to $41 million in 2010. About half the increase in this funding ($10 million per year) will come from large collaborative center grants. The other half of the increase ($10 million per year) will come from increasing the faculty size from 114 to 130, and increasing the per faculty research funding to $300,000 per year per faculty.

Up until June 30, 2005 the College of Engineering received 36.5% of the Indirect Cost Overhead on all research grants. Beginning July 1, 2005 the central administration has agreed to return 50% of the ICR overhead. Then we will be able to pay for the entire research expenses within the college and also balance the budget.

If we get 50% overhead from $40 million research funding by 2010, we should be getting about $5.3 million of ICR funds back to the College. The approximate breakdown of the research funds will be as follows:

- An average of about $900,000 per year of startup funds for new faculty (assuming six new faculty being hired per year with an average startup funds of $150,000)
- $600,000 of cost sharing of large center grants (assuming we will have $10 million per year of center grants with 6% cost sharing)
- $500,000 funds for seed funding of ten projects at $50,000 per project
- $750,000 of funds for renovation of research labs
- $400,000 of summer support for Deans, Department Heads, new faculty, etc.
- $200,000 of incentives for research awards for faculty.

It can be seen that using the following plan, we will be able to pay off the ICR deficit of $1.6 million over a five year period ($100,000 in Year 1, $200,000 in Year 2, etc.) and also be financially independent in the research enterprise.

Table 3.7. Financial Plan for Research in College of Engineering.

INDIRECT COST RECOVERY						
RESEARCH FUNDING	FY05 (Actual)	FY06	FY07	FY08	FY09	FY10
Grant & Contract Expenditures (input)	$21,000,000	$21,000,000	$25,000,000	$30,000,000	$35,000,000	$40,000,000
Projected ICR Return (36.5% in FY05 and 50% thereafter)	$2,029,091	$2,779,577	$3,309,020	$3,970,824	$4,632,628	$5,294,432
ICR EXPENDITURES						
Trade ICR funds to pay '05 Budget Cut		$566,794	$566,794	$566,794	$566,794	$566,794
Startup Expenses ($150K per new faculty)	$500,000	$712,000	$1,325,000	$900,000	$900,000	$1,500,000
Cost Shares (1.5% of research budget per year)	$200,000	$315,000	$375,000	$450,000	$525,000	$600,000
Other Operating (Increase 7% per year)	$536,511	$574,067	$614,251	$657,249	$703,256	$752,484
NCF Subsidy	$110,000	$116,667	$116,667	$50,000	$50,000	$50,000
ERC S. Campus Rent	$0	$34,365	$68,730	$68,730	$68,730	$68,730
Seed Funding for New Research Projects	$0	$350,000	$350,000	$500,000	$500,000	$500,000
Research Lab Renovation	$0	$250,000	$250,000	$400,000	$500,000	$750,000
TOTAL ICR EXPENDITURES	$1,346,511	$2,918,892	$3,666,442	$3,592,773	$3,813,780	$4,788,008
State Surplus (Deficit)	-$496,913	$11,690	$20,975	-$45,911	-$150,161	-$755,976
TOTAL ICR ACTIVITY	**$185,667**	**-$127,626**	**-$336,447**	**$332,140**	**$668,686**	**-$249,553**
Add Beginning ICR Balance	$1,321,963	$1,407,630	$1,080,004	$443,557	$425,697	$744,383
Add Beginning ICR Year-End Account Deficit	-$1,656,159	-$1,556,159	-$1,356,159	-$1,056,159	-$706,159	-$356,159
Payoff of ICR Year-End Account Deficit	$100,000	$200,000	$300,000	$350,000	$350,000	$356,159
ENDING ICR RESERVES	**-$148,529**	**-$276,155**	**-$612,602**	**-$280,462**	**$388,224**	**$138,672**

3.1.3. PHYSICAL

The specific needs for 2010 for physical space and infrastructure are:

- Allocate space among departments based on issues such as undergraduate and graduate student enrollment, faculty, and research expenditures.
- Improving the infrastructure of existing buildings in the COE, specifically the SEO building.
- Use of expanded space in Science and Engineering Lab (SEL) backfill when the College of Liberal Arts and Sciences vacates space in SEL when the new Advanced Chemical Technology building is built.
- Building a new 150,000 sq. ft. building for the College of Engineering called Institute for Nano- and Bio-technology
- Increase the total space for the College of Engineering from the current 267,000 sq. ft. to 417,000 sq. ft.

Action

The College of Engineering has six departments and eight research centers that are housed in five buildings:

1. Science and Engineering Offices (SEO). The College of Engineering occupies portions of the 1st and 2nd floors, the 8th floor, 9th floor, 10th floor, 11th floor, 12th floor, and 13th floor. It houses the offices of the College of Engineering Administration, and the offices of the Department of Computer Science, the Department of Electrical and Computer Engineering and a portion of the Bioengineering Department. The remaining space in the SEO building is occupied by the Math, Statistics and Computer Science Department of the College of Liberal Arts and Sciences.
2. Science and Engineering Labs. This houses the research labs of faculty in ECE, BIOE, CS, MIE, and CME departments. The remaining space is occupied by the College of Liberal Arts and Sciences.
3. Engineering Research Facility. This houses the offices of the Mechanical and Industrial Engineering Department and the Civil and Materials Engineering Department. It also houses three centers, namely, the Electronic Visualization Lab (EVL), the Nanotechnology Core Facility (NCF), and the Manufacturing Research Center (MRC).
4. Chemical Engineering Building. This building, which is located east of Interstate 90/94, about 20 minutes off campus, houses the Chemical Engineering offices and labs.
5. A small portion of the College of Medicine building on the west campus. This houses a portion of the Bioengineering faculty offices and labs.

We now describe the space and infrastructure action plan in more detail for each of the four categories:

- Allocate space among departments based on issues such as undergraduate and graduate student enrollment, faculty, and research expenditures.
- Improving the infrastructure of SEO building.
- Use of expanded space in Science and Engineering Lab (SEL) backfill
- Building a new building for the College of Engineering

Develop policies for Space Allocation

The total space in the College of Engineering is distributed among the six departments as shown in Table 3.8. In the future, we will develop policies to allocate and reallocate space among various departments using various metrics such as undergraduate and graduate student enrollment, size of the faculty, and research expenditures.

Table 3.8. Distribution of space, faculty, students, and research funding among departments

		Fall '04	Fall '04	Fall '04	Fall '04	FY05	Space/	Space/	Grant Exp/
Dept	Sq. Ft.	Faculty	Undergrads	Grads	Total Students	Grant Exp	Faculty	Student	Sq. Ft.
Bioe	22,559	11.83	186	180	366	$2,547,000	1,907	62	113
Chem E	20,405	8.00	65	46	111	$998,000	2,551	184	49
CS	36,200	29.50	215	201	416	$6,854,000	1,227	87	189
ECE	40,846	29.75	639	180	819	$3,220,000	1,373	50	79
Civil	49,374	14.35	189	97	286	$1,845,000	3,441	173	37
MechE	68,427	20.66	347	157	504	$3,508,000	3,312	136	51
College	237,811	114.09	1,641	861	2,502	$18,972,000	2,084	95	80

Table 3.8 shows various metrics, as of FY05, such as space in sq. ft. per faculty, space in sq. ft. per student, and research funding per sq. ft. of space in each department. As can be seen, the College average space per faculty is 2,084 sq. ft. per faculty, and 95 sq. ft. per student, and research expenditure of $80 per sq. ft. Some departments have significantly lower space per faculty, or space per student, or lower research expenditures per square feet, while others have significantly more space per faculty, more space per student, and more research expenditures per square feet. We will develop policies to reallocate space among departments so as to make the space distribution more equitable.

Improving the Infrastructure of the SEO Building

The SEO building was built more than 40 years ago. The entrance to the building is through two vestibules, which look very old and unappealing. Each year, hundreds of students, parents, faculty and company visitors come into the building and get a poor impression of the College of Engineering.

In the near future, we will do some minor renovations in the 1st floor and 8th floor of the SEO building in the College of Engineering offices. This will include remodeling of the two vestibules, the elevator lobby areas of the 1st floor, and the elevator lobby areas and corridors on the 8th floor. We will also provide some new signage and some directories on the 1st floor to inform visitors that the SEO building is home to the College of Engineering.

We will also explore the creation of an auditorium and a faculty/staff dining area in the east end of the first floor of SEO by closing off the open space.

Remodeling Existing SEL Building

UIC is planning to build a new building called Advanced Chemical Technology (ACT) building within three years. That building will be occupied by faculty and researchers from the Chemistry, Biology and Physics departments. This is expected to release some space from the Science and Engineering Lab (SEL), primarily from the three departments listed above from the College of Liberal Arts and Sciences. There is a planning committee that is evaluating how the space that is vacated in SEL can be put to use. The College of Engineering is planning to bring the Chemical Engineering department from the Chemical Engineering Building (east of I-90/94) into that building. In addition, some of the space will be used for housing faculty and students and labs of the Bioengineering Department.

In addition, the Civil and Materials Engineering department does not have any high bay space for its structures instruction or research. It has to be the only civil engineering department in the country to be so constrained. This contributes to increasing the costs and effort of their structural research program and prohibits certain types of civil engineering projects. It also makes it difficult to adequately conduct instructional laboratories in this important civil engineering area of study. We will explore whether it is possible to remodel some space in the SEL building or ERF building to put in a high bay.

New Building: Institute of Nano- and Bio-Technology

The College of Engineering's Strategic Plan 2010 envisions increasing the undergraduate student population from 1550 to 1900, increasing the faculty size from 114 to 130, increasing the number of Teaching Assistants from 92 to 106, and our overall annual research funding from $21 million to $40 million. A key component of this strategy is to recruit additional faculty in selected interdisciplinary areas such as (1) Biotechnology (2) Nanotechnology (3) Information Technology and (4) Infrastructure and Environmental Technology. This cannot be done without new space. This request is for a new engineering building of approximately 150,000 sq. ft. to support this new strategic plan for growing the College of Engineering.

The proposed title would be the Institute for Nano and Biotechnology. This building will house College of Engineering offices and labs for new and existing faculty, staff, TA's, and adjuncts. We plan to hire 16 additional faculty and 12 replacement faculty in the next four years. In order to support the hiring of 16 new faculty, we will need 48,000 sq. ft. of space for them (assuming 3000 sq. ft. per new faculty hired).

In addition we will need to bring in the Chemical Engineering Department faculty (about 20,000 sq. ft.) back to the main East campus. Additional space will be needed for instructional labs, TAs, conference rooms, and lecture halls. This will foster more collaboration between faculty and efficiency of operations. Even assuming no growth, new space is needed to address the current shortage, which is at crisis levels as described below.

The cost of a new engineering building of about 150,000 sq. ft. would be about $45 million, assuming a construction cost of $300 per square foot. The College will undertake a major fundraising effort over the next five years that will generate funds that can contribute to partially funding a new building. We plan to raise about $15 million through fundraising, and would like to request from the State of Illinois the additional $30 million on a 2:1 matching basis.

The college will pay for the increased faculty and students from the increased tuition revenue, increased ICR return percentage, and an undergraduate tuition. We expect research expenditures to double by 2010 to about $40 million per year. At that level the indirect costs generated, to the campus, will be approximately $10.6 million per year. The college expects the new faculty hires and additional research to be predominantly in the emerging areas of nano and biotechnology. This will require a broader focus on interdisciplinary research. Nanotechnology involves our ECE, CME, MIE, and Chemical Engineering departments. Biotechnology involves our Bioe, CS, MIE, and ECE departments. In order to recruit top faculty we will need state of the art labs, sufficient office space, and an aesthetically pleasing building. A new building will also allow Engineering to consolidate its operations and thus foster more interdisciplinary collaboration.

There would be additional costs for whatever it takes to operate a new building. Since the new building would generate additional ICR revenues to campus some of these funds could be used to offset increased operating expenditures. Our projected research funding in the College is supposed to increase from $21 million to $40 million. The overhead that we hope to generate from this increased research funding is about $10.6 million. We will be able to pay for operational costs of the new building through the increased ICR revenue.

3.1.4. CAPITAL

- Successfully raise $50 million through fund raising from alumni, friends, and companies with the following breakdown.
- Endowed Chairs $8 million (Four chairs at $2 million each)

- Professorships $6 million (12 total at $500,000 each)
- Graduate Fellowships $3 million (12 total at $250,000 each)
- Undergraduate Fellowships $1.8 million (12 total at $150,000 each)
- Research Funds $2 million
- Facilities $16 million (Classroom, lab renovation $1 million; New building $15 million)
- Annual Giving $700,000
- Gift in kind $12 million (Software and equipment donation)

3.2. RESOURCE PROCUREMENT STRATEGY

3.2.1. REALLOCATION

The UIC College of Engineering has developed some policies for reallocation of existing resources.

TA Reallocation Policy

The College of Engineering has allocated funding t o support 92.5 TAs in the College for 2005-06 academic year. The College of Engineering's new TA allocation policy across the 6 departments will be based on the following:

- Course enrollments (35%)
  - Looked at actual course enrollments in courses in the past two years (e.g. Fall 2003, Spring 2004, Fall 2004 and Spring 2005)
  - Assume that 30 student classes need one 50% TA, a 15 student course gets one 25% TA, and a 60 student course gets two 50% TAs)
  - Include TAs for labs
  - Scale it to 92.5 total TAs in College.
- Total Student Enrollment (25%)
  - Look at actual Fall 2004 enrollment. Assume 15:1 ratio of TA to undergrad This is the revenue generator for the college ($2500 per student).
  - Scale it to 92.5 total TAs in College.
- RA support ability in department (25%)
  - If you have N RAs, you get ¼ N TAs assuming that students are supported 1 year as TA and 4 years as RA)
  - Look at RA count in Fall 2004 and Spring 2005
  - LOOK AT RAS in DEPT irrespective of source
  - Scale it to 92.5 total TAs in College.
- Total number of Ph.D. students graduated per year (15%)
  - Assuming that N students graduate per year, you need N TAs if you support 1st year students only)
  - Scale it to 92.5 total TAs in College.

Table 3.9 shows the TA allocation across the 6 departments based on these metrics.

Table 3.9. Teaching Assistant Allocation Based on New COE Policy.

Dept	Course enrollment	Undergrad enrollment by major	RA support	Ph.D Graduates	Proposed TA allocation	Current TA allocation	Change in TA Allocation
BIOE	**5.9**	**10.5**	**19.5**	**17.1**	**12.0**	6.5	**5.5**
CHE	**3.1**	**3.8**	**4.4**	**8.5**	**4.5**	7.0	**-2.5**
CS	**17.9**	**12.1**	**23.3**	**18.5**	**18.0**	20.0	**-2.0**
ECE	**37.4**	**36.1**	**18.0**	**5.7**	**27.5**	27.0	**0.5**
CME	**12.2**	**10.5**	**9.3**	**12.8**	**11.0**	13.0	**-2.0**
MIE	**16.1**	**19.4**	**18.1**	**29.9**	**19.5**	19.0	**0.5**
COLLEGE	**92.5**	**92.5**	**92.5**	**92.5**	**92.5**	92.5	**0.0**

Faculty Reallocation Policy

The College of Engineering has allocated funding to support 114 faculty positions in the College for 2005-06 academic year. The College of Engineering's new faculty allocation policy across the 6 departments will be based on the following:

- TEACHING (60%)
  - Undergraduate enrollment by major two years (15%)
  - Graduate enrollment by major two years (15%)
  - Course enrollments in undergrad and grad courses two years (30%)
  - Scale it to 130 total faculty in College.
- RESEARCH
  - Total research funding for all faculty in department two years (10%)
  - Average research funding per faculty in department two years (10%)
  - Average research funding new faculty in past 5 years (10%)
  - Ph.D. student graduation two years (10%)
  - Scale it to 130 total faculty in College.

-

Table 3.10 shows the faculty allocation across the 6 departments based on these metrics.

Table 3.10. Faculty Allocation Based on New COE Policy.

Dept	Undergrad enrollment	Graduate enrollment	Course enrollment	Total research funding all faculty	Average research funding all faculty	Average research funding new faculty	PhD graduates	Proposed allocation based on 130 faculty
BioE	14.8	26.5	8.8	18	28	34	16	18.6
ChE	6.4	6.5	4.3	7	18	18	20	9.5
CS	16.1	34.4	26.2	45	30	21	18	26.8
ECE	47.0	27.0	48.5	25	16	22	24	34.2
CME	15.7	14.4	16.4	13	18	20	20	16.5
MIE	29.2	21.2	25.8	23	20	15	31	24.2
COLLEGE	130	130	130	130	130	130	130	130

Space Reallocation Policy

The College of Engineering is in the process of developing new policies for space allocation and reallocation based on policy across the 6 departments will be based on the following:

- TEACHING LAB SPACE
  - Undergraduate enrollment by major two years
  - Graduate enrollment by major two years
  - Course enrollments in undergrad and grad courses two years
- RESEARCH LAB SPACE OF FACULTY
  - Total research funding for faculty member in past two years
  - Total number of currently registered full time Ph.D. and M.S. students that are being advised by faculty
  - Total number of Research Assistants that are supported in past two years
  - Ph.D. student graduation two years
  - Type of research (experimental versus theoretical/computer simulation)

3.2.2. NEW FUNDING

State Funding and Tuition Revenue

The State of Illinois has been reducing its support of higher education in recent years hence the State funding for UIC has been decreasing. The College of Engineering has endured budget cuts totaling almost 25% in the past 5 years. This has resulted in reduction in the size of our faculty, the number of Teaching Assistants, and hence the total number of undergraduate and graduate students. In 2005, even though there was a flat State budget, the College of Engineering had to undertake a 2.5% cut to provide some basic raises to faculty and staff salaries, and also suffered a 3.1% cut owing to unavoidable expenses at a UIC campus level. This resulted in a $510,000 budget cut which was offset this past year through our increased ICR return of 50%. However this trend cannot continue. If next year, we again face a flat budget, and we are forced to pay for the faculty and staff salary raises, we will be forced to reduce our budget even further.

The UIC College of Engineering is a strong force for economic development and trains a large educated workforce in the area of technology. Hence it is hoped that there will be a partial return to the historic levels of State support for this mission.

If State funding to maintain and enhance the quality of education at UIC is not forthcoming from the state, UIC will join the University of Illinois as a whole in asking students to pay for a larger portion of the cost of their education.

We are assuming a tuition increase each year for undergraduate and graduate students. This will bring in additional $290,000 each year.

We plan to increase the undergraduate student enrollment from 1550 students to 1900 students. The Provost has discussed returning $2,500 per undergraduate. Our Fall 2005 undergraduate enrollment number for undergraduates is 1,550. Hence we plan to get an additional revenue of $647,500 from the state owing to this increased undergraduate enrollment.

We plan to increase the graduate student enrollment from 854 students to 1,000 students. The Provost has discussed returning $1,800 per graduate student. Hence we plan to get additional revenue of $250,200 from the state owing to this increased graduate enrollment.

In addition, beginning in FY06, the College increased its tuition differential to $1,500 per undergraduate student and $1,734 per graduate student per year. The undergraduate differential applies to all students except the academic year ’04 class. Their differential is $920 because under the Illinois Guaranteed Tuition Program they are guaranteed the same tuition rate as when they first enrolled. As these ’04 students graduate the higher

tuition differentials will apply to an increasing percentage of our undergraduate students. We plan to generate additional revenue of $986,970 by 2010 from tuition differentials.

Research Program

The UIC College of Engineering has a total research funding of $21 million, but we plan to double our research funding to $40 million by 2010. We will increase our total research funding by several mechanisms:

1. Increasing our faculty size from its current 114 faculty to 130 faculty
2. Increasing the relative number of research active faculty from the current 85 research active faculty to 110 research active faculty
3. Increasing the research funding per faculty
4. Providing incentives to faculty to increase research by reducing teaching loads to two semester courses per year by making it easier to buy out of teaching
5. Providing some small portion of the Indirect Costs generated from research funds back to the Principal Investigators or Yearly Research Awards to the faculty
6. Providing seed funding for new collaborative projects
7. Writing large collaborative research project proposals
8. Exploring a wide range of federal agencies and industries to secure research funding.

The College of Engineering currently gets 36.5% of the Indirect Cost Overhead on all research grants. The central administration has agreed to return 50% of the ICR overhead. We will be able to pay for the entire research expenses within the college and also balance the budget. If we get 50% overhead from $40 million research funding by 2010, we should be getting about $5.3 million of ICR funds back to the College.

Private Fund Raising

- Successfully raise $50 million through fund raising from alumni, friends, and companies with the following breakdown.
- Endowed Chairs $8 million (Four chairs at $2 million each)
- Professorships $6 million (12 total at $500,000 each)
- Graduate Fellowships $3 million (12 total at $250,000 each)
- Undergraduate Fellowships $1.8 million (12 total at $150,000 each)
- Research Funds $2 million
- Facilities $16 million (Classroom, lab renovation $1 million; New building $15 million)
- Annual Giving $700,000
- Gift in kind $12 million (Software and equipment donation)

Revenue from International Master's Program

The UIC College of Engineering has signed a large number of agreements with foreign universities. Presently, vigorous programs exist with the Polytechnics of Milan and Turin.

The agreement with the Politecnico di Torino involves students from the Politecnico who apply and are admitted to the M.S. degree program in Electrical and Computer Engineering, or in Mechanical Engineering, and who take courses toward their UIC degree at Torino. The courses are taught in English according to the UIC Graduate Catalog by Adjunct Professors hired and paid by our COE. The students come to Chicago to defend their MS thesis in front of a committee whose Chairperson and the majority of members are from the COE. Students pay resident tuition and the general fee only, by special permission of the Chancellor, and the tuition is refunded to the COE. A similar agreement is in effect with the Politecnico di Milano for students who pursue the MS degree in Computer Science. However, those students are required to spend one semester in residence at UIC.

We plan to continue these programs. The net revenue from these programs per year is about $160,000.

Revenue from Professional Master's Program

The College of Engineering has an online Master of Engineering program. We will augment the online MENG program with live professional Master's curricula in various departments. These degrees can be called Masters in Information Technology, Masters in Biotechnology, Masters in Nanotechnology, Masters in Infrastructure/ Environmental Technology, and Masters in Energy Technology Separate committees will be appointed on each proposed topic.

A general format for such a Master's program will be to require eight courses. Students would take two courses during each semester, and complete their Masters degree in two years. Alternately, they can take one course a semester, and finish their Master's degree in four years.

Here is one way each program can work and can be financially profitable as shown in the table below. These professional engineering courses will be taught by UIC College of Engineering faculty who will be provided extra compensation (e.g., $10,000 per course). There will be no Teaching Assistants provided for any of these courses. Hence the cost for offering the courses will be limited to the faculty compensation.

We can limit the enrollment to about 30 students in each year (60 students per year for two classes of students). If two out of three courses will be required, our class sizes will therefore be limited to 20-30 students. At a time, we will have to offer only six courses per semester since we will have two classes of students: first year students and second year students. Students will register for only two courses (out of three that will be offered) per semester (four a year). The courses will be offered in UIC classrooms on weekday evenings twice a week from 6-9 PM, or on Saturdays from 9AM-12 noon and 1-4PM. This will be convenient to the students who will not have to take one day off work to drive to the Chicago campus. Assuming that the students pay a tuition of $2340 per course, we will have a revenue of $561,600 per year. We will have to pay 8 instructors about $10,000 each with a total cost of $80,000. The program can be administered by

one administrative assistant with a salary of $40,000. We assume that there will be marketing and mailing costs of $84,000. Hence there will be a profit of $281,000 per year per Masters program. Table 3.11 shows the financial projections for each Professional Master's Program.

Table 3.11. Financial Projections for each Professional Master's Program.

FINANCIAL PLAN FOR EACH PROFESSIONAL MASTERS PROGRAM		
Number of students in Year 1	30	
Number of students in Year 2	30	
Number of courses for Year 1 students	4	
Number of courses for Year 2 students	4	
Tuition per course	$2,340	
Total tuition revenue from all students		$561,600
Number of courses offered per year	8	
Faculty compensation per course	$10,000	
Faculty needed to teach per year	8	
Total compensation for faculty	$80,000	
Salary for administrative assistant	$40,000	
Salary for Associate Dean	$20,000	
Marketing and mailing	$84,000	
10% fee to Provost office	$56,160	
Total expenses		$280,160
Net Profit		$281,440

SECTION 4

EVALUATION OF PLAN

4.1. IMPLEMENTATION TIMETABLE

The implementation timetable for the above plan is five years. We plan to achieve the results of the plan by 2010.

We plan to increase our undergraduate student enrollment from 1550 to 1900. Table 4.1. shows the target growth plan of our undergraduate enrollment in six departments and the College of Engineering. We will do this by a variety of strategies that are described earlier. The increase in the enrollment will generate additional revenue to the college to hire additional faculty and teaching assistants.

Table 4.1. Undergraduate student growth plan in College of Engineering.

	AY06	AY07	AY08	AY09	AY10
B.S. students	1550	1650	1750	1850	1900

We plan to increase our graduate enrollment from 854 to 1000. We will increase the total number of graduate students to 1000 students and also change the relative mix of students in favor of more Ph.D. students. Specifically, we will target a total M.S. enrollment at 400, and total Ph.D. enrollment at 600. We will do this by a variety of strategies that are described in later sections. Table 4.2. shows our growth plan in graduate students.

Table 3.2. Graduate student growth plan in College of Engineering.

College grad students	AY06	AY07	AY08	AY09	AY10
MS	430	400	400	400	400
Ph.D.	424	525	550	575	600
TOTAL	854	925	950	975	1000

We plan to increase our faculty from our current number of 114 faculty to 130 by 2010. The faculty hiring plans are provided in Table 4.3. We plan to hire 28 new faculty over this period. We believe we will need to hire 16 new faculty and 12 replacement faculty.

Table 4.3. Faculty growth plan in College of Engineering

	FY06	FY07	FY08	FY09	FY10
College Faculty FTE	114	117	120	123	130

We plan to increase our Teaching Assistants from our current number of 92 half time positions to 106 half time positions by 2010

Table 4.4. Teaching Assistant growth plan in College of Engineering

	FY06	FY07	FY08	FY09	FY10
College Faculty FTE	92	96	100	102	106

We plan to increase our research funding from our current $21 million in 2005 to $40 million by 2010. Table 4.5 shows the growth plan.

Table 4.5. Research Funding growth plan in College of Engineering

FY05	FY06	FY07	FY08	FY09	FY10
$21,000,000	$21,000,000	$25,000,000	$30,000,000	$35,000,000	$40,000,000

4.2. PERFORMANCE METRICS AND RESULTS

The specific performance metrics for each of these issues are summarized below by categories.

4.2.1. Faculty

The specific performance metrics for 2010 for faculty are:

- Grow the total faculty size of the college to 130 faculty from its current 114 faculty positions.
- Hire 28 new faculty, 16 new and 12 replacement faculty through retirements and resignations
- Recruit faculty in clusters by growing selective areas of excellence
- Promote only the best faculty with national and international reputations
- Appoint four faculty as Chaired Professors
- Appoint 12 faculty with Professorships

- Have 75% of our Full Professors as Fellows of their societies such as IEEE, ASME, ASCE, ACM, AAAS.
- Have 50% of our Assistant Professors receive NSF CAREER awards by the time they are promoted to Associate Professorship
- Have 2% of our faculty in the Membership of the National Academy of Engineering
- Have women and minority individuals comprise at least 10% of our faculty; 15% of the new hires should be women or minorities.

4.2.2. Research

The specific performance metrics for 2010 for research are:

- Our faculty (size 114 in 2006 growing to 130 in 2010) should publish 500 journal papers and 500 conference papers per year in prestigious journals and conferences, an average of four journal papers and four conference papers per faculty per year.
- Our faculty should publish their papers in the top-ranked journals and conferences in their fields in order to have high impact.
- Our faculty should transfer technologies to industry by filing invention disclosures and patents
- Our faculty (size 114 in 2006 growing to 130 in 2010) should collectively bring in $40 million in research funding by 2010, with an average of $300,000 per year per faculty
- We will organize the research areas of the College into clusters of interdisciplinary research in the fields of Bio-technology, Nano-technology, Information Technology, and Infrastructure and Energy/Environmental Technology.
- We should submit at least five large interdisciplinary research proposals per year to agencies such as NSF, NIH, and DARPA at a funding level of greater than $1 million per year per project
- We should get at least one large interdisciplinary research project funded per year by agencies such as NSF, NIH, and DARPA at a funding level of greater than $1 million per year per project
- We should graduate 60 Ph.D.s per year at an average of 0.5 Ph.D. per faculty per year.

4.2.3. Undergraduate Program

The specific performance metrics for 2010 for undergraduate programs are:

- Grow the total undergraduate student population of the college from its current 1,550 students to 1900 students without lowering our standards for admission.
- Recruit high quality students to the engineering college; specifically, by 2010, we will increase the average ACT score of all incoming freshmen students from 25.8 to 27 and the average Projected Grade Point Average (PGPA) from 25 to of 27

- Provide students with access to an exciting and relevant undergraduate curriculum in engineering.
- Increase the number of B.S. graduates per year from 387 to 450
- Increase graduation rates from 60% to 80% in the college.
- Make sure that average students can graduate in five years if they take a full course load every semester.
- Make sure that diversity is reflected in the student population; ensure that 20% of our students are members of minority groups; ensure that 30% of our students are women.
- Raise funding for 12 additional undergraduate scholarships in the College of Engineering

4.2.4. Graduate Program

The specific performance metrics for 2010 for graduate programs are:

- Increase the total number of graduate students from 854 students to 1000 students
- Change the mix of students in favor of more Ph.D. students than M.S. students
- Target M.S. enrollment at 400
- Target Ph.D. enrollment at 600
- Ensure that M.S. students can graduate in two years if they take a full course load every semester
- Ensure that Ph.D. students can graduate in five years if they take a full course load every semester
- Increase M.S. graduation rates to 80% in the college
- Increase Ph.D. graduation rates to 75% in the college
- Limit the number of M.S. graduates per year to 200
- Increase the number of Ph.D.. graduates per year from 41 to 60
- Recruit high quality Ph.D. students with an average GRE score of 770/800 in quantitative, average score of 600/800 in verbal, and average score of 730/800 in analytical (suitably adjusted for the new analytical writing test with a scale from 0 to 6).
- Provide students with access to an exciting, relevant and interdisciplinary graduate curriculum in engineering
- Ensure that diversity is reflected in the student population. Ensure that 10% of our graduate students are minority; Ensure that 20% of our graduate students are women
- Raise funding for 12 additional graduate fellowships in the College of Engineering.

4.2.5. Professional and International Programs

The specific performance metrics for 2010 for professional and international programs are:

- Deemphasize the current Master's of Engineering (MENG) program with internet courses
- Focus the energy on developing Professional Masters Programs with live instruction
- Master's in Bio-technology, Information Technology, Energy Technology
- Have at least 60 students in each program over two years
- Focus on strong international programs with a select set of universities
- Make the programs financially profitable

4.2.6. Corporate and Alumni Relations

The specific performance metrics for 2010 for corporate and alumni relations are:

- Create an integrated office of Corporate Relations and Student Career Placement
- Work with the UIC Career placement office to ensure program consistency and leveraging of tools and activities.
- Target placement of UIC engineering students in top companies
- Evolve present Co-op/Internship program to be industry driven and fully Web-based.
- Actively promote Co-op/Internship program to achieve over 90% enrollment of qualifying students.
- Increase College of Engineering staff/capacity to support at least a 70% placement rate of the enrolled base in the Co-op program.
- Assist the career placement of undergraduate and graduate engineering students by more effectively bringing industry to UIC. Improve tracking and follow up of graduating students. Provide post graduation career service support to the engineering alumni base.
- Create an Industrial Advisory Board consisting of 24 members from companies, two from government agencies, four Deans of Engineering from other universities, and three Venture Capitalists
- Successfully raise $50 million through fund raising from alumni, friends, and companies with the following breakdown.
- Endowed Chairs $8 million (Four chairs at $2 million each)
- Professorships $6 million (12 total at $500,000 each)
- Graduate Fellowships $3 million (12 total at $250,000 each)
- Undergraduate Fellowships $1.8 million (12 total at $150,000 each)
- Research Funds $2 million
- Facilities $16 million (Classroom, lab renovation $1 million; New building $15 million)
- Annual Giving $700,000
- Gift in kind $12 million (Software and equipment donation)

4.2.7. Marketing and Rankings

The specific performance metrics for 2010 for marketing and rankings are:

- Study the rankings of engineering colleges and departments in US News and World Report and evaluate the criteria
- Prepare marketing and communications materials (printed and electronic) for various constituents to improve the reputation of the College.
- Separate materials to be prepared for visitors, various Engineering Deans, various department Chairs across the country, prospective students, current undergraduate and graduate students, parents of current students, various companies, and federal agencies.
- Coordinate the development of a better Web page for the College and the various departments.
- Coordinate the development of various printed materials (Undergraduate Programs, Graduate Programs, Research Report, Alumni Magazine).
- Improve the overall graduate and undergraduate rankings of the College of Engineering of UIC in US News and World Report from the current 59 to 40

4.2.8. Administration and Staff

The specific performance metrics for 2010 for administration and staff are:

- Provide resources to maintain efficient administrative and technical staff in the College of Engineering.
- Increase the total number of staff in the College of Engineering from 71 to 75.
- Provide competitive salaries for all staff in the College of Engineering to make the UIC salaries competitive with Big Ten Plus salaries.
- Improve the morale and effectiveness among the staff members.

APPENDIX

Faculty

The detailed data on the distribution of the faculty in various ranks (Professor, Associate Professor, Assistant Professor, and Lecturer) and in various departments is shown in Table A.1 for academic years 1999-2006.

Table A.1. Distribution of COE Faculty by Depts and Ranks During 1999-2006.

BIOENGINEERING	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor	2.00	2.50	2.50	3.58	4.58	5.58	3.58	4.58
Assoc Professor	0.25	0.25	0.83	1.25	1.25	1.25	2.25	4.00
Assistant Professor	3.00	3.50	5.00	8.00	8.00	7.00	6.00	5.00
Lecturers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5.25**	**6.25**	**8.33**	**12.83**	**13.83**	**13.83**	**11.83**	**13.58**

CHEMICAL ENGINEERING	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor	6.00	6.00	6.00	6.00	4.00	4.00	4.00	3.50
Assoc Professor	4.00	4.00	4.00	4.00	5.00	4.00	4.00	2.25
Assistant Professor	2.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lecturers	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00
Total	**12.00**	**11.00**	**11.50**	**11.50**	**9.00**	**8.00**	**8.00**	**5.75**

CIVIL AND MATERIALS ENGINEERING	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor	8.00	8.00	8.00	7.00	7.00	7.00	7.00	7.25
Assoc Professor	4.00	4.00	4.75	3.75	3.75	2.75	2.75	3.75
Assistant Professor	3.75	1.75	3.00	2.00	2.00	3.60	4.60	3.60
Lecturers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**15.75**	**13.75**	**15.75**	**12.75**	**12.75**	**13.35**	**14.35**	**14.60**

MECHANICAL AND INDUSTRIAL ENGINEERING	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor	9.75	12.00	13.00	13.00	13.00	13.00	14.00	13.50
Assoc Professor	8.00	7.00	5.00	3.00	5.00	4.00	2.00	2.00
Assistant Professor	7.50	6.00	7.00	8.00	5.00	3.00	4.00	5.00
Lecturers	2.00	1.55	2.55	2.55	1.55	0.66	0.66	0.66
Total	**27.25**	**26.55**	**27.55**	**26.55**	**24.55**	**20.66**	**20.66**	**21.16**

COMPUTER SCIENCE	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor				7.00	8.00	8.00	6.00	6.50
Assoc Professor				11.50	10.50	13.50	14.50	15.00
Assistant Professor				7.00	7.00	5.00	5.00	4.00
Lecturers				4.00	4.00	4.00	4.00	3.00
Total				**29.50**	**29.50**	**30.50**	**29.50**	**28.50**

ELECTRICAL AND COMPUTER ENGINEERING	AY99	AY00	AY01	AY02	AY03	AY04	AY05	AY06
Professor				9.75	10.75	10.75	8.75	9.75
Assoc Professor				8.50	8.50	8.50	9.50	10.00
Assistant Professor				4.00	3.00	4.00	8.00	8.00
Lecturers				4.00	4.50	4.50	3.50	2.50
Total				**26.25**	**26.75**	**27.75**	**29.75**	**30.25**

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE	**AY99**	**AY00**	**AY01**	**AY02**	**AY03**	**AY04**	**AY05**	**AY06**
Professor	13.25	11.50	14.50					
Assoc Professor	24.75	21.75	19.75					
Assistant Professor	8.75	12.75	10.00					
Lecturers	6.00	7.00	8.00					
Total	**52.75**	**53.00**	**52.25**					

COLLEGE TOTALS	**AY99**	**AY00**	**AY01**	**AY02**	**AY03**	**AY04**	**AY05**	**AY06**
Professor	39.00	40.00	44.00	46.33	47.33	48.33	43.33	45.08
Assoc Professor	41.00	37.00	34.33	32.00	34.00	34.00	35.00	37.00
Assistant Professor	25.00	25.00	26.00	30.00	25.00	22.60	27.60	25.60
Lecturers	8.00	8.55	11.05	11.05	10.05	9.16	8.16	6.16
Total	**113.00**	**110.55**	**115.38**	**119.38**	**116.38**	**114.09**	**114.09**	**113.84**

Research Funding

Table A.2 shows the research funding data for 1999-2005 for the faculty in various departments.

Table A.2. Department and per faculty grants and contracts funding data. The College used to have a combined EECS department prior to 2001 when it was split into ECE and CS departments.

	BioE $ $/Fac.	CME $ $/Fac.	CS $ $/Fac.	ChE $ $/Fac.	ECE $ $/Fac.	MIE $ $/Fac.	ERC $ $/Fac.	EECS $ $/Fac.
1999	$267,822 $51,014	$1,665,383 $105,739		$759,701 $63,308		$2,296,586 $90,954	$1,006,107	$3,900,598 $83,435
2000	$405,100 $64,816	$1,768,241 $128,599		$732,948 $66,632		$2,760,548 $110,422	$1,012,922	$6,294,755 $136,842
2001	$894,105 $107,336	$1,768,631 $112,294		$828,502 $75,318		$3,235,865 $129,435	$1,423,265	$6,888,969 $155,683
2002	$1,592,394 $124,115	$1,628,204 $127,702	$6,807,453 $266,959	$795,308 $72,301	$2,388,882 $107,365	$3,143,440 $130,977	$2,897,871	
2003	$1,848,881 $133,686	$1,586,089 $124,399	$9,708,202 $380,714	$694,854 $77,206	$3,482,145 $156,501	$2,951,012 $128,305	$3,473,602	
2004	$2,589,752 $187,256	$1,899,482 $142,283	$6,386,658 $241,006	$712,563 $89,070	$3,604,231 $155,021	$3,003,560 $150,178	$2,612,141	
2005	$2,547,443 $215,338	$1,845,414 $128,600	$6,854,128 $232,343	$997,603 $124,700	$3,219,837 $108,230	$3,507,631 $169,779	$2,148,925	

Undergraduate Students

Table A.3 shows the detailed data on the undergraduate student distribution in the College and various departments in various ranks (freshmen, sophomores, juniors and seniors) for fall 1999-2005.

Table A.3 Distribution of the College of Engineering Undergraduate students by departments during fall 1999-2005.

Bioengineering

	Freshman	Sophomore	Junior	Senior	Total
1999	19	16	18	32	85
2000	22	14	14	27	77
2001	25	23	15	27	90
2002	45	23	26	41	135
2003	39	38	29	55	161
2004					186
2005					179

Civil and Materials Engineering

	Freshman	Sophomore	Junior	Senior	Total
1999	33	16	21	64	134
2000	27	14	18	56	115
2001	31	15	29	52	127
2002	30	24	36	67	157
2003	40	30	39	77	186
2004					189
2005					206

Computer Science*

	Freshman	Sophomore	Junior	Senior	Total
1999*	92	56	69	119	336
2000*	101	56	68	121	346
2001	107	57	75	120	359
2002	85	58	55	124	322
2003	66	48	58	115	287
2004					215
2005					185

Chemical Engineering

	Freshman	Sophomore	Junior	Senior	Total
1999	32	21	28	79	160
2000	25	15	26	78	144
2001	21	19	24	63	127
2002	13	20	20	55	108
2003	13	9	18	44	84
2004					65
2005					91

Electrical and Computer Engineering

	Freshman	Sophomore	Junior	Senior	Total
1999	197	137	197	329	860
2000	221	117	206	377	921
2001	227	134	175	389	925
2002	180	122	170	346	818
2003	149	86	154	346	735
2004					631
2005					519

Mechanical and Industrial Engineering

	Freshman	Sophomore	Junior	Senior	Total
1999	67	41	76	133	317
2000	84	36	63	148	331
2001	76	47	59	152	334
2002	67	51	52	135	305
2003	83	57	63	121	324
2004					347
2005					370

COE

	Freshman	Sophomore	Junior	Senior	Total
1999	440	287	409	756	1892
2000	480	252	395	807	1934
2001	487	295	377	803	1962
2002	420	298	359	768	1845
2003	390	268	361	758	1777
2004	348	209	355	729	1641
2005	312	237	301	700	1550

* Starting Fall 2001, the EECS (Electrical Engineering and Computer Science) Department was split into
2 departments,ECE (Electrical and Computer Engineering) and CS (Computer Science)
1999 and 2000 numbers in CS reflect enrollment in the CS major

Table A.4 reports the number of B.S. degrees in Engineering awarded in years 2000 to 2005.

Table A.4. Number of B.S. Degrees Awarded in 2000-2005 in various departments and the College.

	AY00	AY01	AY02	AY03	AY04	AY05
BioE	11	19	10	17	16	34
ChE	33	32	29	30	33	10
CME	28	27	22	26	44	35
CS	50	58	65	61	61	53
ECE	161	195	196	173	166	171
MIE	65	70	85	74	65	63
College	348	401	407	381	385	366

Graduate Students

Table A.5 shows the detailed data on the graduate student distribution in the College and various departments in various degree programs (Ph.D., M.S) for fall1999-2005.

Table A.5. Graduate student (Ph.D., M.S.) enrollment data for College of Engineering in various departments during fall 1999-2005.

Bioengineering

	MS	PhD	Total
1999	38	26	64
2000	53	39	92
2001	69	48	117
2002	96	70	166
2003	89	91	180
2004	85	95	180
2005	65	105	170

Civil and Materials Engineering

	MS	PhD	Total
1999	43	34	77
2000	49	29	78
2001	66	27	93
2002	76	25	101
2003	67	32	99
2004	61	36	97
2005	56	39	95

Computer Science

	MS	PhD	Total
1999			
2000			
2001	174	59	233
2002	143	74	217
2003	115	86	201
2004	109	92	201
2005	151	101	252

Chemical Engineering

	MS	PhD	Total
1999	27	17	44
2000	38	18	56
2001	40	13	53
2002	35	20	55
2003	21	27	48
2004	14	32	46
2005	11	28	39

Electrical Engineering and Computer Science

	MS	PhD	Total
1999	414	80	494

2000	424	93	517

Electrical and Computer Engineering

	MS	PhD	Total
1999			
2000			
2001	194	48	242
2002	212	64	276
2003	104	97	201
2004	85	95	180
2005	78	98	176

Mechanical and Industrial Engineering

	MS	PhD	Total
1999	90	59	149
2000	87	56	143
2001	108	65	173
2002	116	60	176
2003	119	65	184
2004	85	72	157
2005	69	53	122

College of Engineering

	MS	PhD	Total
1999	612	216	828
2000	651	235	886
2001	651	260	911
2002	678	313	991
2003	515	398	913
2004	439	422	861
2005	430	424	854

Table A.6 shows the department and College of Engineering data on Ph.D. graduates during fall 1999 to 2005. While the total number of Ph.D. students in the College of Engineering is 422 in 2004, the total number of Ph.D. graduates of 30 is low. In the future, we will try to target a larger number of Ph.D. student graduations from the College.

Table A.6. Department and per faculty Ph.D. production data during 1999 to 2005. The table shows the total number of Ph.D. graduates and the per faculty Ph.D. graduation data.

	COE PhD | PhD/Fac.	BioE PhD | PhD/Fac.	CME PhD | PhD/Fac.	CS PhD | PhD/Fac.	ChE PhD | PhD/Fac.	ECE PhD | PhD/Fac.	MIE PhD | PhD/Fac.
1999		1 | .2	5 | .4		1 | .1		11 | .4
2000		1 | .1	3 | .2		3 | .3		8 | .3
2001	28 | .3	5 | .4	6 | .5	1 | .03	4 | .3	4 | .2	8 | .3
2002	26 | .2	2 | .1	5 | .4	7 | .2	1 | .1	1 | .04	10 | .4
2003	42 | .4	10 | .7	4 | .3	7 | .2	3 | .4	6 | .2	12 | .6
2004	30 | .3	2 | .1	6 | .5	6 | .2	3 | .4	2 | .1	11 | .5
2005	41 | .4	7 | .6	5 | .3	4 | .1	8 | 1.0	11 | .4	6 | .3

Table A.7 shows the number of M.S. degrees conferred in the College of Engineering during 1999 to 2004.

Table A.7. M.S. Degrees Conferred During 1999 to 2005

Year	COE M.S.	BioE M.S.	CME M.S.	CS M.S.	ChE M.S.	EECS M.S.	ECE M.S.	MIE M.S.
1999	189	9	12		7	115		46
2000	223	8	14		10	156		35
2001	244	13	23		4	178		26
2002	202	22	18	44	9	35	32	42
2003	245	27	18	78	10		74	38
2004	302	17	38	73	5		95	74
2005	200	34	20	27	11		52	56