A Message from the Dean to College Community

Dear Faculty, Staff, Students, Alumni, Advisory Council Members, Industry Liaisons, and Friends:

The attached draft five-year strategic plan is the result of one year of planning and soul searching within the college community, which began with discussions at the chairs planning session, and continued with a series of discussions at the Strategic Planning Think Tank – formed of faculty, staff, students and industry liaison. The draft has also been submitted to the College Faculty Council of Governance for additional comments.

This document is intended to be concise and impactful with a newly crafted vision and mission as well as specific goals and measurable objectives. We are entering a period of seeking broad input from the entire college community in the hope of finalizing the document by the middle of the fall semester. The Strategic Planning Think Tank will then work with the Chairs Council to develop an implementation plan for the next five years. I would like to take this opportunity and thank the Think Tank for all its efforts during this past year.

Please review the document closely and provide us with your valuable comments. This is an opportunity for you to influence the path that your college will be taking, and we would like to be as inclusive as possible in incorporating ideas and suggestions from the entire college community. Remember that we need your support in crafting the vision for the college just the same as in realizing that vision over the course of this plan.

Sincerely,

Amir Mirmiran, PhD, PE, FASCE, FACI
Professor and Dean

On January 13, 2011, the Faculty Council on Governance at the College of Engineering and Computing ratified the draft strategic plan, and recommended with a unanimous motion addition of moving the college to the new facilities in the main campus during the implementation stage of the strategic plan.
Florida International University (FIU) is Miami-Dade County’s first public university. As an anchor public institution in South Florida, FIU is a leading student-centered urban public research university that is locally and globally engaged to find solutions to the most challenging problems of our time. With over 40,000 students on the heels of four decades of growth, FIU is one of the 25 largest universities in the nation, and is ranked first among all four-year colleges in awarding bachelor’s and master’s degrees to Hispanic students [Hispanic Outlook in Higher Education]. FIU offers more than 200 bachelor’s, master’s and doctoral degree programs in various colleges and schools, including its most recent additions – the Colleges of Law and Medicine.

The College of Engineering and Computing has its roots in the FIU’s College of Technology that dates back to early 1970’s as one of the first academic units in the university. The College was officially formed in 1984 as the College of Engineering and Applied Sciences. Twenty five years later, we celebrate a quarter century of excellence, supported by exponential growth that we have enjoyed over the years. Although regarded as a young college, our tradition of excellence and innovation is intertwined with a culture of diversity, reflected in our dedicated faculty and growing alumni base of well over 13,000 Golden Panther Engineers. In 2005, School of Computing and Information Sciences joined the College, and the College was renamed to Engineering and Computing.

The College houses the School of Computing and Information Sciences and five departments: Biomedical Engineering, Civil and Environmental Engineering, Construction Management, Electrical and Computer Engineering, and Mechanical and Materials Engineering. The College offers 10 BS/BA, 11 MS, and six (6) PhD degree programs in various fields of engineering, computing, construction and management. The College also offers global programs and dual degree programs.

The College boasts a student body of about 4,400 (3,500 undergraduates, and over 250 doctoral students – Fall 2009). The College ranks among the 25 largest undergraduate engineering programs in the nation [ASEE 2008], with most of its programs amongst the largest of their peers [ASCE 2008]. Most notably, Computer Science program ranks 4th largest among its peers in schools of engineering [ASEE 2008]. Computer Engineering and Electrical Engineering programs also rank 11th and 37th largest, respectively, among their peers [ASEE 2008].
The diversity of our student body has always been a source of pride and distinction for our College. We continue to be the top producer of Hispanic engineers at all levels from in the Continental United States. We also ranked 8th amongst all engineering schools in the nation in BS degrees awarded to African Americans, and among the top 10% of engineering schools in BS degrees awarded to women [ASEE 2008].

VISION

As an educational leader in a changing economic, technological, and social environment, the FIU College of Engineering and Computing is committed to excellence, quality, sustained growth and access while offering our students an outstanding and rigorous education in an environment that supports intellectual growth. The College carries out research that contributes significantly to the advancement of the strategic priorities of the university, the region and the nation, while enhancing the research capabilities and scholarly achievements of its faculty and students.

MISSION

As the research engine of the university, and as a strong force for Miami’s economic development, the College is committed to providing quality education, problem-solving research, and community engagement through local relevance, national visibility, and global exposure. The College will strive to enhance the quality of life for its students, faculty, alumni, and the community. The College’s research mission is the pursuit of the discovery and application of innovative engineering ideas and technologies that will continue to enhance the economic vitality and quality of life in our community, our region, and the nation.

STRENGTHS AND OPPORTUNITIES

Leverage our existing diversity to expand our global presence: The College’s diverse student body can extend our influence nationally and internationally to improve global recognition of the College of Engineering and Computing brand. We will continue to strengthen our ties with the alumni locally, regionally, nationally and internationally; develop advanced technology to deliver educational/training programs targeted to regional, national, and international markets; and improve the College’s presence and image in the community. The College has a responsibility to the community to take a leadership role in educating, communicating, and engaging quality of life issues by addressing the needs of the South Florida region. We will achieve this goal by strengthening our ties to the government and educational institutions; broadening areas of involvement in education, training, research, and economic development; establishing partnerships and collaboration with educational institutions, industry, and research between the public and private sectors.

The overarching question that helps us shape a model strategic plan for the future of the College is what will it look like in the next five years:

- Growth rate and characteristics (including demographic composition) of our undergraduate and graduate student body;
- Growth rate and characteristics (including demographic composition) of our faculty;
- Research funding portfolio and research institutes and centers; and
- Engineering campus, learning environment for our students, and the work environment for our faculty and staff.
STRATEGIC GOALS

GOAL 1: Enhance the quality, improve the retention and graduation rates, and accelerate the growth of undergraduate programs

The main focus will be to increase the retention and graduation rates, while expanding the reach of the undergraduate programs and improving the instructional quality, with the following specific objectives:

- Increase six-year retention rate for FTIC (First Time in College) from 59.6% to 65%;
- Increase four-year retention rate for AA (Associate degree in Arts) from 66.7% to 70%;
- Increase six-year graduation rate for FTIC from 38.7% to 56% (national average);
- Increase four-year graduation rate for AA from 47.5% to 60%;
- Ensure instructional efficiency and consistent quality by continuous improvement of the fundamental engineering courses common to various programs in the college, and eliminate duplications and excessive overlaps;
- Ensure higher quality of the programs by monitoring employment rate, professional licensure passing rates, and alumni and employer survey comments;
- Continuous improvement and tuning of the curricula to the states of the art and practice, and increase electives of interest to students, particularly in research and development, entrepreneurship, and communication skills;
- Achieve the target growth of 6% per year for the undergraduate program with active recruitment at high schools, community colleges, and science and math classes at the university; and
- Increase the capacity of undergraduate program by expanding the distance learning options within the constraints of accreditation requirements.

Develop new international undergraduate programs.

GOAL 2: Enhance the quality, improve the retention and graduation rates, and accelerate the growth of graduate programs

The main focus will be the quality improvement of our graduate programs and the growth of our doctoral programs, with the following specific objectives:

- Improve selection criteria for admitting graduate students, from the current (Fall 2009) average GPA of 3.2 for admitted MS students to 3.5; average GRE of 1196 and GPA of 3.3 for admitted Ph.D. students to 1250 and 3.7, respectively;
- Improve retention and graduation rates and time-to-degree for graduate students;
- Improve written and oral communication skills of graduate students through writing workshops, graduate seminars and a jointly crafted course with the English Department;
- Increase students’ exposure to research by encouraging and facilitating their attendance at workshops and conferences along with major professors;
- Add new PhD programs
• Provide pre-faculty mentoring of doctoral students in the areas of teaching and grant-writing;
• Increase the number of Ph.D. degrees awarded from the average of 0.32 per faculty per year in 2008-09 to a target of 0.5-0.75; and
• Increase the professional masters programs with wider options, including the weekend executive, online, off-site and overseas programs.
+ Work with oversees institutions and agencies to expand the existing international activities and to develop new graduate and student exchange programs.

GOAL 3: Enhance student engagement and the quality of service to all stakeholders

The main focus will be to improve the quality of service to stakeholders by engaging the students and integrating resources through improved communications, with the following specific objectives:

• Establish an effective and consistent communication network within the College Community;
• Improve the quality of the student pipeline by working with the community in STEM education;
• Expand student services to provide more peer-to-peer tutoring, expand the engineering library with appropriate learning environment, quiet study areas and group study facilities, recreational facilities, Internet Café, and book store at the engineering center;
• Provide a richer campus life experience for students with social activities and intramural sports;
• Develop a master plan for the engineering campus for a future industrial research park;
• Enrich career services to expand mentorship and internship opportunities, soft skill workshops, and social events with community stakeholders to allow networking opportunities for students;
• Reduce inefficiencies and maximize utilization of resources;
• Encourage and involve stakeholders to participate in the fabric of academic life, including faculty and student lectures, student clubs, competition sponsorships, and QEP;
• Institute programs and create an environment that promote a culture of achievement and entrepreneurship amongst students.
In spite of its short history, the FIU College of Engineering and Computing has already developed a number of areas of research strength that will continue to be flourishing. Simultaneously, the College strives to be responsive to the emerging challenges and opportunities that the new century and the global environments of research and economic activities present. This enhanced research activity will seek to maintain a pace of 10% growth in research awards, to reach $25M per year by FY 2014-15. Some key areas for the continued and accelerated development of research endeavors will include:

- **Energy and Environmental Technologies: Biotechnology, Alternative Energy, Sustainability**
  Together, energy and environment, represent both a distinct need in South Florida and a major strength of the College. Biotechnology has been a major investment from the State of Florida with notable research institutes establishing a biotechnology presence in both South and Central Florida. Water availability, conservation, and coastal resources are areas of critical importance especially to South Florida with the neighboring Everglades. The College has already established strong ties with local agencies on water conservation and sustainability research, as well as with major utility companies in the areas of Smart Grid and power distribution. Alternative energy production is a global initiative and a strategic concern for the nation, as well as a perfect match for the expertise available in several departments of the College.

- **Health Related Technologies**
  For several decades, South Florida has been home to a number of representatives of the biomedical device industry. The diversity of expertise available in various departments is well suited to take advantage of the impending expansion of the medical instrumentation and healthcare record-keeping industries, as the new approaches used in Health Information Technologies will be more comprehensive, requiring developments at multiple levels, such as bio-nano sensors, biomaterials, biomechanics, bioinformatics, biomedical data mining, networking, intelligent human-computer interfaces for health systems, and database management.

- **Infrastructure: Hurricane Resiliency, Sustainability and Intelligent Transportation**
  Infrastructure is the backbone of the America’s economy. Building smart power grids, better utility network, wind-resilient and sustainable infrastructure, and mitigating the existing system, are especially critical to hurricane-prone areas such as South Florida. The College, in partnership with the International Hurricane Research Center (IHRC), has built a strong team of wind and structural engineers that are supported by state-of-the-art facilities, including the Wall of Wind (WoW) and the Structures and Construction Testing Laboratory. Similarly, through the Lehman Center for Transportation Research (LCTR), the College is well-positioned to develop advanced technologies such as Intelligent Transportation Systems (ITS) and Structural Health Monitoring (SHM) Systems that will help mitigate our clogged and aging transportation infrastructure through SMART (Sustainable Multimodal Advanced Regional Transit) system initiative.
The success of the College in reaching its goals in education, research, and service will stem from the engagement, dedication and efficiency of its faculty in leveraging the vast pool of complementary expertise that exists throughout the University. To promote this engagement and collaboration, the College will foster the development of a strong faculty base, with the following specific objectives:

- **Motivating the continued development of faculty in their selected career paths**
  The College will encourage and support the involvement of its faculty in activities that will enhance their capabilities in various areas, including excellence in teaching, research and community engagement. The College will help facilitate faculty interaction with granting agencies and research sponsors. The College will also incentivize mentorship of junior faculty members by successful senior faculty, and will promote the sharing of experiences and best practices amongst faculty.

- **Proactively facilitate the retention of talented faculty and research staff and the recruitment of highly capable graduate students**
  The College will develop enhanced mechanisms to reward the success of faculty members in research, teaching, and community engagement. It will develop systems to facilitate the continuity of the support that is needed for research staff and graduate students. It will also coordinate and supplement the support the University Graduate School provides to the faculty in their efforts to recruit highly capable graduate students and research staff.

- **Establish policies to reward excellence in faculty accomplishments**
  Effectiveness in securing research sponsorship will be rewarded through policies that will result in tangible benefits to faculty members who succeed in attracting significant funding and developing scholarly work. Full engagement of the research potential of the faculty will be promoted through policies such as a Research Supplement Program. Engagement will also be promoted by facilitating the re-investment of dividends from research into the support provided to faculty through mechanisms such as accessible (assignment) “buy-out” procedures, to enable research-oriented faculty to focus sharply and excel in research. Similarly, faculty accomplishments in the areas of teaching and community engagement will be rewarded to encourage faculty accomplishments in their selected career paths.

- **Facilitate multi-investigator, multi-unit research**
  Innovative solutions to contemporary technical challenges are often found at the intersection of engineering sub-disciplines or in the overlapping areas of the sciences. The College will strive to remove administrative and implementation barriers that could hamper the multi-investigator or multi-unit collaborations that will be required to face the critical challenges in the future. Key elements of the effort will be the equitable recognition and credit given to the efforts of co-investigators in group projects and the assignment of faculty members to develop their research work in multi-disciplinary clusters.

- **Foster a Discovery-to-Application Philosophy among faculty**
  In the best tradition of the true spirit of engineering (ingenuity), the College will promote among the faculty the aspiration to convert their successes in basic research to the realm of application and the development of end-user products, in association with industrial partners. To this end the College will facilitate the interaction and collaboration of its faculty with relevant industry and will support patenting efforts and the preservation of the intellectual property of its faculty. The College will also seek to take the best possible advantage of its location and resources to invite the involvement of relevant industry parties in joint ventures and long-term partnerships, such as those that would be solidified by the creation of a Research Park on the grounds of the FIU Engineering Center.
Strategic Planning Think Tank

1. Dr. Syed Ahmed, Associate Professor, Construction Management
2. Dr. Jean Andrian, Associate Professor, Electrical and Computer Engineering, Chair, Subcommittee on Education
3. Dr. Armando Barreto, Professor, Electrical and Computer Engineering
4. Mr. Howard (Skip) Bechtold, Student, Civil and Environmental Engineering
5. Dr. Chin-Sheng Chen, Professor, Engineering Management
6. Dr. Ali Ebadian, Professor, Mechanical and Materials Engineering – Chair
7. Ms. Alicia Fernandez, Doctoral Student, Biomedical Engineering
8. Dr. Albert Gan, Associate Professor, Civil and Environmental Engineering
9. Dr. Kinzy Jones, Professor, Mechanical and Materials Engineering – Chair, Subcommittee on Research
10. Dr. Wei-Chiang Lin, Associate Professor, Biomedical Engineering
11. Dr. Christine Lisetti, Associate Professor, Computing and Information Sciences
12. Dr. Naphtali Rishe, Professor, Computing and Information Sciences
13. Ms. Lilia Silverio-Minaya, Associate Director of Research
14. Dr. Berrin Tansel, Professor, Civil and Environmental Engineering – Chair, Subcommittee on Service
15. Mr. Daniel Whiteman, President, Coastal Construction, Member, College Advisory Council
Message to College Stakeholders
Faculty, Staff, Students, Alumni, Advisory Council Members, Industry Liaisons, and Friends:

Please send us your comments on the College's Draft Strategic Plan by September 20, 2010.

Name:

Email:

Message: