College of Engineering and Computing

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The College of Engineering and Computing is committed to educate professionals who can serve industry and the community at large in a wide variety of fields, as well as conduct innovative basic and applied research that meets the technical needs of industry and government, improves the quality of life, and contributes to the economic viability of Florida, the Nation, and the world.

The College of Engineering and Computing consists of two schools: School of Computing and Information Sciences and OHL School of Construction, and four academic departments: Biomedical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical and Materials Engineering. These academic departments offer programs leading to the Master of Science and Doctor of Philosophy degrees.

The College has two institutes and thirteen centers supporting its academic and research programs. The institutes are the Advanced Materials Engineering Research Institute (AMERI) and the Telecommunications and Information Technology Institute (IT2). The centers are the Bioinformatics Research Group (BioRG), Center for Advanced Distributed Systems Engineering, Center for Advanced Technology and Education (CATE), Center for Diversity in Engineering and Computing (CDEC), Center for Emerging Technology for Advanced Information Processing and High-Confidence Systems, Center for the Study of Matter at Extreme Conditions (CeSMEC), Distributed Multimedia Information Systems Laboratory, Engineering Manufacturing Center (EMC), Eugenio Pino and Family Global Entrepreneurship Center, High Performance Database Research Center and the Lehman Center for Transportation Research (LCTR). Two major university centers, the Applied Research Center (ARC) and International Hurricane Research Center (IHRC) work very closely with the College of Engineering and Computing with many joint appointments at the faculty level.

The College has created an open-access Motorola Nanofabrication Research Facility to conduct research in nanoelectronics, bio/nanosensors and nanomaterials. In addition, the FIU College of Engineering and Computing has developed many collaborations with the industry and hospitals in Florida and across the nation.

Bachelor of Science degree programs in the College of Engineering and Computing are offered in the following fields of study:
- Biomedical Engineering
- Civil Engineering
- Computer Engineering
- Computer Science
- Construction Management
- Electrical Engineering
- Environmental Engineering
- Information Technology (also B.A.)

Mechanical Engineering
Undergraduate Professional Certificates are available in:
- Aerospace Engineering
- Heating, Ventilation and Air Conditioning Design
- Materials Engineering
- Robotics Engineering
- Sustainable Construction

The programs of the College are directed towards the practical use of scientific, engineering, and technical principles to meet the objectives of industry, business, government, and the public.

The College provides each student with the opportunity to develop a high level of technical skills and to obtain an education which will prepare him or her for a rewarding career and personal growth.

Underlying the programs of the College is a recognition that the growing impact of technology upon the quality of life is increasing and that the proper application of technology is critical to meeting current and emerging human needs.

The College faculty is actively engaged with business, industry and government. Faculty members also participate in a variety of basic and applied research projects in areas such as energy, transportation, solid waste disposal, biomedical devices and instrumentation, computer engineering, artificial intelligence, manufacturing, robotics, telecommunications, microelectronics, structural systems, biotechnology, systems modeling, information technology, environmental sciences and engineering, image processing engineering education, etc. Undergraduate students are given the opportunity to participate in many of these research projects.

Educational Objectives for Computer Science

The computer science program is designed to give our students an outstanding education. To illustrate the excellence of our program, please note the educational objectives below that are met in our program.

1. To provide our graduates with a broad-based education that will form the basis for personal growth and life-long learning.
2. To provide our graduates with a quality technical education that will equip them for productive careers in the field of Computer Science.
3. To provide our graduates with the communication skills and social and ethical awareness requisite for the effective and responsible practice of their professions.
4. To prepare students for BS level careers or continued graduate education.

Educational Objectives for Engineering

All engineering programs in the college are designed to give our students an outstanding education. To illustrate the excellence of our program, please note the educational objectives below that are met in every Engineering program.

1. Develop within our graduates a basic foundation in the fundamental areas of engineering and to provide the technical proficiency needed for the professional practice of engineering.

Our graduates will be able to:
A. Design a system, component, or process to meet desired needs related to the major technical areas encompassed by engineering.
B. Design and conduct experiments and analyze and interpret data related to at least two of the major technical areas encompassed in engineering.
C. Identify, formulate, and solve a wide range of engineering problems.
D. Apply knowledge of mathematics, science and engineering to solve a wide range of engineering problems.
E. Utilize the techniques, skills, and modern scientific tools necessary for contemporary engineering practice.

2. Develop within our graduates the ability to communicate their ideas effectively within the technical community and to the general public.

Our graduates will demonstrate an acceptable level of proficiency in:
A. Written communication
B. Oral communication
C. Working with others as part of a multidisciplinary team.

3. Prepare our graduates to take their places in society as responsible citizens.

Our graduates will demonstrate an appreciation for and an understanding of:
1. Contemporary issues facing society as a whole.
2. The local and global historical, social, economic, and political context and impact of engineering solutions to societal problems.

4. Provide our graduates with the basis for, and instill within them an appreciation for enthusiasm for lifelong scientific inquiry, learning and creativity.

Our graduates will:
A. Understand that graduation is but a beginning step in the development of professional engineering competency.
B. Appreciate the need for life-long learning to maintain and enhance the professional practice of engineering.
C. Be equipped with the basic knowledge and approach to learning that will allow them to benefit from continued scientific inquiry and learning.

5. Foster within our graduates the development of an understanding for the need to maintain the highest ethical standards in their personal and professional lives.

Our graduates will:
A. Demonstrate an understanding of professional integrity and ethical responsibilities.
B. Demonstrate an understanding of professional responsibility issues as they relate to public interest, health, and safety.

Educational Objectives for Construction Management

The construction management program is designed to give our students an outstanding education. To illustrate the excellence of our program, please note the educational objectives below that are met in our program.

1. To educate undergraduate construction management majors through a program of academic learning designed to provide the management and technical knowledge required for entry level professional positions in the construction industry.
   A. Have a good understanding of principles of management.
   B. Have knowledge of economics, accounting and business law.
   C. Have knowledge of building codes and standards.
   D. Have technical knowledge and ability to identify and understand civil, electrical, mechanical and structural systems.

2. To furnish the graduate construction management majors an advanced level of education designed to provide the management and analytical knowledge required for managerial positions in the construction industry.
   A. Have ability to analyze construction problems.
   B. Have knowledge to solve construction problems.
   C. Have ability to plan, estimate and schedule construction projects.
   D. Have ability to manage construction projects and processes.

3. Develop within our graduates the ability to communicate their ideas effectively within the technical community and to the general public. Our graduates will have an acceptable level of proficiency in:
   A. Written communication
   B. Oral communication
   C. Working with others in a project team

4. Foster within our graduates the development of an understanding for the need to maintain the highest ethical standards in their personal and professional lives.

Our graduates will:
A. Demonstrate an understanding of professional integrity and ethical responsibilities.
B. Demonstrate an understanding of professional responsibility issues as they relate to public interest, health, and safety.

Educational Objectives for Information Technology

1. To provide our graduates with a broad-based education that will form the basis for personal growth and life-long learning.
2. To provide our graduates with a quality technical education that will equip them for productive careers in the field of Information Technology.
3. To provide our graduates with the communication skills and social and ethical awareness requisite for the effective and responsible practice of their professions.

Educational Objectives for Information Technology

1. To provide our graduates with a broad-based education that will form the basis for personal growth and life-long learning.
2. To provide our graduates with a quality technical education that will equip them for productive careers in the field of Information Technology.
3. To provide our graduates with the communication skills and social and ethical awareness requisite for the effective and responsible practice of their professions.

Accreditation for Computer Science

The School of Computing and Information Sciences offers curricula leading to the degree of Bachelor of Science in Computer Science, Bachelor of Arts and Bachelor of
Science in Information Technology. The Bachelor of Science in Computer Science is accredited by the Computing Accreditation Commission, ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, Telephone: (410) 347-7700.

Accreditation for Engineering

The Engineering Accreditation Commission of ABET, Inc., accredits engineering programs on a nationwide basis. Students wishing more information about accreditation should consult their respective departmental office or the Office of the Dean. The following baccalaureate engineering programs in the college are currently accredited by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, Telephone: (410) 347-7700: Biomedical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Industrial and Systems Engineering and Mechanical Engineering.

Accreditation for Construction Management

The American Council for Construction Education (ACCE) accredits construction management programs on a nationwide basis. The baccalaureate construction management program in the College is accredited by the ACCE.

Admission Preparation

Prospective students who are considering engineering should follow an academic program to meet engineering prerequisites. The student planning to transfer to the engineering program as a junior should follow a pre-engineering program in the first two years of college work. Many courses required by the engineering curriculum are specialized in their content and students need to select lower division courses with care. The normal maximum number of credits transferred from a community college is 60 semester credits.

Freshman admission to the University is determined by the University and College admission standards. The freshmen should have had high school preparation of considerable depth and breadth. Specifically, students interested in engineering should have preparation in mathematics (algebra, geometry, trigonometry, analytical geometry, or pre-calculus) and chemistry. Physics and introduction to computers are recommended, but not required. Admitted freshmen students planning to major in an engineering program should contact an advisor in their respective discipline as early as possible.

Engineering and Computer Science Admission Policy

The student must be able to place in MAC 2311 (Calculus I) or higher, in order to declare major in biomedical engineering, civil engineering, computer engineering, computer science, electrical engineering, environmental engineering, or mechanical engineering. Students who desire to pursue these majors but are not able to place in MAC 2311 (Calculus I) may be assigned to the Exploratory Physical Sciences and Engineering track, and can declare major in engineering or computer science only after they meet this requirement.

In order to enroll into upper division Engineering and Computer Science courses, a student must earn a grade of “C” or higher in all Calculus courses, Differential Equations, Physics I with Calculus, Physics II with Calculus, and Chemistry I.

The admission policy for freshmen and transfer students are different and the policies may vary in each department. (Refer to the Admission Policy in the department of your choice.)

FIU Freshmen

Students seeking admission to an undergraduate degree program will be admitted by the Admissions Office if the following criteria are met:

a. All general admission requirements of the University are satisfied.

b. The student must be able to place in MAC 2311 (Calculus I) or higher in the FIU entry placement examination, in order to declare major in biomedical engineering, civil engineering, computer engineering, computer science, electrical engineering, environmental engineering, or mechanical engineering.

Transfer Students

All transfer students must meet the general University requirement for admission. The student must be able to place in MAC 2311 (Calculus I) or higher in order to declare major in biomedical engineering, civil engineering, computer engineering, computer science, electrical engineering, environmental engineering, or mechanical engineering. Students must have a grade of “C” or higher in all Calculus courses, Differential Equations, Physics I with Calculus, Physics II with Calculus, and Chemistry I. There is a two-step process in the evaluation of transfer credits.

a. The Office of Admissions will make a preliminary evaluation of the student’s background for general compliance and determination of applicable Core Curriculum courses taken.

b. The specific department will determine the exact transfer of applicable credit. The departmental evaluation is the final word in this matter.

FIU adheres to the Florida Department of Education Articulation Agreement between the Universities and Community Colleges of the State of Florida. Therefore,
transfer of credit from Florida Community Colleges is facilitated.

Preference is given to Associate of Arts degree holders from Florida Community Colleges. For holders of other degrees, it is suggested that application is made about three months prior to the beginning of the term.

For specific course requirements, see the departmental sections, shown later in the catalog.

College of Engineering and Computing

Dismissal Policy

A student who has been dismissed from the University for the first time may see his/her advisor to begin the appeal procedure. The advisor will determine if the student is eligible to appeal the dismissal or if there is a way to lift the dismissal. If the student is eligible, he or she must make an appointment to see the chairperson or associate chairperson. The student must bring a letter stating when he or she was dismissed the first time and what he or she is going to do to ensure that he or she is not dismissed a second time. The student must also sign an agreement stating that he or she understands that the department will not allow a second reinstatement if the student is dismissed again. If the chairperson determines that the student is worthy of reinstatement, he or she will prepare and sign a memo for the Dean's consideration stating the conditions for the student to be reinstated (the student will be readmitted on academic, probation). If the student does not meet these conditions, he or she will be dismissed a second and final time from the program.

Any student who is dismissed a second time from FIU will not be readmitted under any circumstances. Institutional policy is that students may appeal to the Dean's Office, but only a first dismissal appeal is considered in the College of Engineering and Computing; a second dismissal appeal will not be accepted.

The College of Engineering and Computing will uphold the following institutional policies:

Academic Salvage

A student who is dismissed and subsequently receives an AA degree from another Florida public institution of higher learning can appeal to the department and may be readmitted to the program. The student's GPA will be recalculated.

Academic Amnesty

After 6 years of NOT taking courses at any College or University, an FIU undergraduate may reapply to the program. If readmitted, a student's FIU GPA will be set at 0.0. However, credit for previous University courses in which the student received a minimum grade of “C” may be applied toward the degree, (not the GPA), subject to determination by the department through which the student is attempting to earn the degree.

For more information or to find out if you are eligible, see your advisor.

Transfer of Courses to Engineering Programs

Courses from ABET-accredited universities will be transferred under the discretion of the engineering department. Course equivalencies will be determined solely by the department advisor, associate chairperson, or chairperson. Any other faculty member in the Department, College, or University cannot officially grant transfer credits under any circumstances.

Courses from non-ABET accredited programs (including foreign institutions) will only be accepted as long as all of the following requirements are met:

a. The College/University is recognized and accredited by the appropriate governing bodies (to be determined by our office of admissions)

b. For courses that are not offered directly from the student’s Engineering department at FIU, a memo must be obtained by the student from the appropriate FIU department stating that the course is equivalent to the required course at FIU.

c. Any engineering course considered for transfer must be a 100% engineering science course at FIU. If the course is partially or completely designated as an engineering design course at FIU, it cannot be transferred. All transferred engineering courses must have the consent of the chairperson or associate chairperson of the student’s department.

d. The student must earn the equivalent grade to what is required in the courses here at FIU (i.e., if a department requires a “C” in Physics, then the student must have a grade equivalent to a “C” at their university of origin).

e. Technology credits and life experience credits will not be accepted as engineering credits under any circumstances.

Academic Support Services

The area of academic support services is responsible for the coordination of academic advising and student services activities for the College of Engineering and Computing. This area is also responsible for keeping students informed of educational opportunities such as scholarships, tuition waivers, internships, Co-op studies and campus resources; serves as a liaison between the academic departments and the student support services university wide and facilitates the registration process in order to make sure that the students adhere to the college guidelines.

A student who has been accepted to a degree program in the College must obtain and consult an advisor prior to the first class enrollment. An advisor may be seen by contacting the Department in which an academic major is desired. Continued contact (at least once per semester) with the advisor is required to review progress and select courses for each succeeding semester. Such contact is required until an approved program of study is completed.

Cooperative Education

A Cooperative Education (Co-op) Program is conducted by the College in conjunction with the Department of Cooperative Education in the Division of Student Affairs. In this program, students spend alternate semesters in school full-time and fully employed in industry in a technical position directly related to their major. Students receive full pay for their work in industry.

Placement in Co-op positions is arranged by the Co-op Department and includes both local and national industrial, business and governmental agencies. Co-op students typically agree to spend at least three work periods in industry.
Applicants for the program are evaluated by the College and should contact the appropriate chairperson. Based on three work periods, students should enter the program during the first semester of the junior year. Inquiries from lower-division students, prior to transfer to the University are encouraged since work may be arranged immediately upon enrollment. The Co-op program also offers the Parallel Co-op whereby a student might alternate work and study during the same semester by attending the University part-time and working part-time in industry.

In addition to the university wide scholarships the College of Engineering and Computing offers scholarships as listed below: Most are restricted to students who are United States citizens or permanent residents.

Apply for these scholarships on our website [www.eng.fiu.edu/html2002/index.htm](http://www.eng.fiu.edu/html2002/index.htm).

**Biomedical Engineering Excellence Scholarship – Biomedical Engineer** – Merit-based scholarship is now available for FIU Undergraduates as well as transfer students with at least 60 credit hours. There are several $5,000 scholarships for an allocation of $1,250 over a period of four semesters. 3.0 GPA is required for eligibility and retaining of the award, while student’s SAT score and a written statement will also be considered for the award. Before receiving the scholarship, students must declare Biomedical Engineering as their major. For more information, please call (305) 348-6950.

**Kimley Horn and Associates Inc. Scholarship Civil Engineer:** Senior undergraduate or Graduate Civil Engineering students. Member of a recognized minority group, Award: $500 per academic year. Scholarship applications are available at the College of Engineering website [www.eng.fiu.edu](http://www.eng.fiu.edu).

**Leonard Kauffmann Endowed Scholarship:** Undergraduate junior or senior Industrial and Systems Engineering. This is a one time award of $500. There are two awards per academic year. Scholarship applications are available at the College of Engineering and Computing website [www.eng.fiu.edu](http://www.eng.fiu.edu).

**HNTB Scholarship in Civil Engineering – Civil Engineering:** Undergraduate or Graduate Civil Engineering students. Award: $500 per academic year. Scholarship applications are available at the College of Engineering and Computing website [www.eng.fiu.edu](http://www.eng.fiu.edu).

**Sergio Martinez Endowed Scholarship:** Undergraduate junior or first semester senior Industrial and Systems Engineering. This is a one time award of $500. There is one award per academic year. Scholarship applications are available at the College of Engineering and Computing website [www.eng.fiu.edu](http://www.eng.fiu.edu).

**Randall L. Nida Memorial/Cordis Corporation Scholarship – Industrial and Systems Engineering:** Undergraduate student in Industrial and Systems Engineering, U.S. Citizen, Award: $1,000 per academic year.

**CSEMS Scholarship – Industrial and Systems Engineering:** Eligibility requirements: U.S. citizen, permanent resident, or refugee at time of application. Be admitted to FIU or have submitted application for admission (in any program offered by the Department of Industrial and Systems Engineering). Attend FIU full-time (12 credits/semester undergraduate, 9 credits/semester graduate). Financial need for undergraduate students by submitted FAFSA. For graduate students by providing most recent tax return.

**Association of Professional Estimators Bruce Morris Undergraduate Scholarship – Construction Management:** A $1000 scholarship is awarded annually to a student enrolled in the Construction Management program who is considering pursuing a career in South Florida. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Catalfumo Construction Undergraduate Scholarship – Construction Management:** Three scholarships of $4,000 each are awarded to students enrolled in the Construction Management program who are considering pursuing their careers in South Florida. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Catalfumo Construction Graduate Fellowship – Construction Management:** An $18,000 graduate fellowship is awarded each year to a graduate student enrolled in the Construction Management program who is considering pursuing a career in South Florida. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Centex Construction Undergraduate Scholarship – Construction Management:** A $1000 scholarship is awarded annually to a student enrolled in the Construction Management program who is considering pursuing a career in South Florida. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Consul Tech Scholarship in Civil Engineering – Civil Engineer:** Undergraduate or Graduate Civil Engineering students. Award: $1000 per academic year. Scholarship applications are available at the College of Engineering website [www.eng.fiu.edu](http://www.eng.fiu.edu). 3.00 GPA. A Summer internship will also be awarded to scholarship recipient.

**COSCAN Scholarship – Construction Management:** Two $1000 scholarships are awarded annually to students enrolled in the Construction Management program who are considering pursuing their careers in South Florida. 2.5 GPA. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Marlin Engineering Scholarship in Civil Engineering – Civil Engineer:** Two $1500 scholarships are awarded to undergraduate students enrolled in the Civil Engineering program each year. Scholarship applications are available at the College of Engineering and Computing website [www.eng.fiu.edu](http://www.eng.fiu.edu).

**American Bankers Insurance Group Inc. Scholarship – Industrial and Systems Engineering:** $1,000 per academic year. Full-time undergraduate student in Industrial and Systems Engineering. Junior year standing at time of award, U.S. citizen or permanent resident. Minimum of 3.0 GPA, Internship may be offered as part of award.

**Construction Association of South Florida Scholarship:** Scholarships are awarded annually to students enrolled in construction schools throughout the country who are considering pursuing their careers in South Florida. Selections are conducted by the Scholarship committee on behalf of the membership and board of directors. Scholarship applications are available at the CM Department website [www.cm.fiu.edu](http://www.cm.fiu.edu).

**Condotte-American/MXD:** Requirements are a CM major, financial need, leadership, etc. Applications available at CM Department. Applications normally due by
mid April, award of scholarship for next academic year made in July. Amount of scholarship is currently $1,500 for one academic year, and not automatically renewable. Scholarship applications are available at the CM Department website (www.cm.fiu.edu).

Southern Gear Scholarship – Mechanical or Industrial Engineer: Up to $1,000 per academic year / unmet need U.S. Citizens or Permanent Residents. Resident of Miami Dade County All levels. Minimum 3.0 GPA. Scholarship applications are available at the College of Engineering and Computing website (www.eng.fiu.edu).

Turner Construction Undergraduate Scholarship – Construction Management – a $5,000 scholarship is awarded each year annually to a student enrolled in the Construction Management program. Scholarship applications are available at the CM Department website (www.cm.fiu.edu).

Turner Construction Graduate Scholarship – Construction Management- a $5,000 graduate scholarship is awarded each year annually to a graduate student enrolled in the Construction Management program. Scholarship applications are available at the CM Department website (www.cm.fiu.edu).

Please note that in most cases, neither the college nor the department administer the scholarship funds listed below nor do they select the recipients. Additionally we need the contact info for these scholarship opportunities/applications.

Building Officials & Inspectors: Requirements are a CM major, financial need, leadership, etc. Applications are available at CM Department. Applications due by September 13, 2009. Amount of scholarship is $1,000, not automatically renewable.

Associated General Contractors of America Scholarship: Requirements are for a full time student. Applications are available online or from the Department. Applications are available in July and must normally be submitted by November 01. Award amounts are $2,000 annually for undergraduate students, renewable up to $8,000 total, and $7,500 annually for graduate students. Graduate student scholarship is not renewable.

ASHRAE Scholarships – Mechanical Engineering: Scholarships are available to undergraduate engineering, engineering technology and graduate students enrolled full-time in a curriculum approved by the Accreditation Board for Engineering and Technology (ABET) or other accrediting agency recognized by ASHRAE.

SAE Scholarships – Mechanical Engineering: Money is available for both undergraduate and graduate engineering students through generous contributions from various corporations and universities. These scholarships are funded through the SAE Foundation.

ASME Scholarship – Mechanical Engineering: Through the efforts of the ASME Board of Governors, ASME Foundation, the ASME Auxiliary, ASME Councils on Education, Engineering and Member Affairs, over $500,000 is awarded annually in low-interest student loans, scholarships and fellowships.

Astronaut Scholarship – Mechanical Engineering: Scholarship candidates must be nominated by faculty or staff, and they must be a junior, senior, or graduate student at one of a select group of schools. Students may not apply directly for the scholarship.

FGLSAMP – Florida Georgia Louis Stokes Alliance for Minority Participation (Legislature): Undergraduate, full time students in the areas of Physics, Biology, Computer Science, Mathematics, Chemistry, Engineering, minimum GPA 2.75, must be a U.S. citizen or resident.

Hispanic College Fund, Inc. – Must be a U.S. citizen of Hispanic background residing in the fifty states or Puerto Rico. Must be pursuing a bachelor's degree in business, computer science, engineering or business-related major.

Non-Residents and International Undergraduate Students – For more detailed information on these scholarships, applicants should contact the Office of Admissions, PC 140 Modesto A. Maidique Campus, (305) 348-4100.

FMI – Florida Mexico Institute – Out of state tuition waivers – Students Who Are Eligible: Students who have been admitted or who meet admission requirements to any university or community college of the public education system of the state of Florida. Preference will be given to graduate students. Mexican citizens studying in Florida with student visas. Students who make a commitment to return to Mexico after the completion of their studies for a length of time equal to their exemption period, as required by the scholarship program.

Academic Requirements: GPA (3.0) and SAT, ACT, CLAS, GRE, GMAT and/or TOEFL scores appropriate for admission to Florida community colleges and universities. Proof of test scores must accompany applications. Evidence of good academic standing for all previous and current levels of study, as well as a sufficiently good record to be admitted to intended educational program of study. Since this is a merit scholarship program, the level of academic achievement is important.

FCI – Florida Caribbean Institute – Out of state tuition waivers: The Florida Caribbean Institute (FCI) is a state-funded program co-directed by Florida International University and Daytona Beach Community College. Its purpose is to expand cultural, educational and commercial ties between the state of Florida and the countries of the Caribbean Basin. FCI offers out-of-state tuition waivers for qualified Caribbean students to attend any of Florida’s public universities or community colleges. It also pursues exchange programs and sister university relationships between members of the Florida State University System and counterparts in the Caribbean, including the University of the West Indies (Jamaica and Trinidad campuses) and institutions in the Dominican Republic. In addition, FCI scholarship program makes it possible for Florida school teachers to attend FIIU’s Haitian Summer Institute.

Non-Florida Residence Scholarship Award

Dean’s Merit Scholarship – For residents and nonresidents. Must be a full-time student in junior standing with a minimum GPA of 3.5. All engineering disciplines welcomed.

Student Organizations and Clubs

Student organizations and clubs enrich the campus in so many ways. They provide an outlet for learning outside the classroom, for meeting other people, for sharing interests, for broadening one’s horizons, for developing life, work & leadership skills, for gaining experience, and for engaging students as citizens of the campus community. At FIU College Engineering and Computing, we follow the philosophy that education is not something to be confined to the classroom. Students grow intellectually and socially by engaging in a broad range of activities. One of the best
ways to start this exploration is by participating in student organizations. Our campus has deep traditions of active involvement and student leadership, and student organizations play a significant role in helping to nourish those traditions. By participating in these groups, students not only enrich their own experiences, but those of their peers, and that is the ideal of shared learning. Listed are some of our currently active student organizations and clubs.

**ACE** – Association of Cuban-American Engineers
**AGC** – Associated General Contractors of America
**APM** – Alpha Pi Mu – Industrial Engineering Honor Society
**ASCE** – American Society of Civil Engineers
**ASHRAE** – American Society of Heating, Refrigeration & A/C Engineers
**ASM/TMS** – American Society of Metals, Minerals Metal and Materials (Triple M)
**ASME** – American Society of Mechanical Engineers
**BMES** – Biomedical Engineering Society
**ESC** – Engineering Student Council
**EWB** – Engineers Without Borders
**FES** – Florida Engineering Society
**FWEA** – Florida Water Environment Association
**HKN** – ETA KAPPA NU – Electrical Engineering Honor Society
**IEEE** – Institute of Electrical and Electronics Engineers
**IIIE** – Institute of Industrial Engineers
**INFORMS** – Institute for Operations Research and Management Science
**ITE** – Institute of Transportation Engineers
**MAES** – Mexican-American Engineers & Scientists
**NSBE** – National Society of Black Engineers
**PI TAU SIGMA** – Honorary Mechanical Engineering Fraternity
**OMEGA RHO** – The International Honor Society of Operations Research and the Management Sciences
**SAE** – Society of Automotive Engineers
**SLX** – SIGMA LAMBDA CHI – International Construction Honor Society
**SHPE** – Society of Hispanic Professional Engineers
**SWE** – Society of Women Engineers
**XE** – CHI EPSILON – National Civil Engineering Honor Society
**TBPi** – TAU BETA PI – National Engineering Honor Society
**TXA** – TAU CHI ALPHA – National Environmental Honor Society

*All of these student organizations and clubs have a link on our FIU website, [http://www.fiu.edu](http://www.fiu.edu).*

**Women in Engineering**

For over 100 years women have been working in the field of Engineering. The long list of Nobel Laureates would inspire anyone to become an Engineer. At FIU 22% of our undergraduate student are women which exceeds the national average of 19%. 25% of our graduate students are women which exceeds the national average of 21% and 24% of our PhD students are women exceeding the national average of 19%. FIU produces over three times the national average of female engineers. We are working along with major corporations such as Motorola to set up student internships, Co-op programs and joint research. The FIU College of Engineering and Computing is proud to announce that for the second time in two years Motorola has awarded the college a grant of $10,000 in support of the "Motorola Women in Engineering" program. Motorola is committed to the promotion of aspiring professional women engineers in our community. Please visit our website at [http://www.fiu.edu/mwie](http://www.fiu.edu/mwie) for more information.

**International Students**

Florida International University (FIU) is a multicultural environment where differences in culture are not only welcome but required. We pride ourselves in the fact that 19% of our students are International. This allows all FIU students to be more culturally knowledgeable and prepared for global challenges in the work place. There are 313 international students from over 80 different countries in the College of Engineering and Computing. The International Student and Scholar Services provide information and services to international students. It also provides helpful tips on registration, the cashiers office and even travel. Please visit our website at [www.fiu.edu](http://www.fiu.edu) for more information.

**General Requirements for a Baccalaureate Degree**

In order to obtain a Bachelor's degree from the College, each student must satisfy the following minimum requirements:

1. Obtain the minimum number of semester credits required by the specific program. Specific requirements are described in the sections devoted to the various departments in the College.
2. Complete at least 35 semester credits in the upper-division at FIU.
3. Attain a minimum grade point average of 2.0 in all courses taken at the University.
4. Satisfy the core curriculum requirements of the State of Florida for the Bachelor’s degree.
5. Satisfy the particular requirements for his or her own major and all University requirements for graduation.

**Scientific Laboratory Fee**

Scientific laboratory fees are assessed for certain courses where laboratory classes are part of the curriculum. Specific information on scientific laboratory fees may be obtained from the academic departments or University Financial Services.

**Prerequisites**

Students must have met the prerequisites and corequisites to register for any course. Otherwise, the student will be dropped from the course before the end of the term, resulting in a grade of ‘DR’ or ‘DF’. Students should refer to the Catalog or see an advisor to determine course prerequisites.

**Course Repeats**

This varies depending upon the particular program. For more information consult your advisor.

**Policies, Requirements, and Regulations**

The University, the Graduate School, and the College of Engineering and Computing have a set of guidelines to protect the student’s rights and to ensure a timely graduation. Students must become familiar with all university, Graduate School, and College's graduate
procedures. These procedures are described in the University’s Student Handbook.

The programs, policies, requirements and regulations listed in the catalog are continually subject to review to serve the needs of the University’s various publics, and to respond to the mandates of the FIU Board of Trustees and the Florida Legislature. Changes may be made without advance notice.

Florida International and the College adhere to opportunity practices, which conform to all laws against discrimination and are committed to non-discrimination with respect to race, color, creed, age, handicap, sex, marital status, or nationality. Additionally, the University is committed to the principle of taking positive steps necessary to achieve the equalization of educational and employment opportunities.

Department-Specific Information
Please refer to your selected department in this catalog for additional information, or call the department:

- Biomedical Engineering: (305) 348-6950
- Civil and Environmental Engineering: (305) 348-2824
- OHL School of Construction: (305) 348-3172
- Electrical and Computer Engineering: (305) 348-2807
- Industrial and Systems Engineering: (305) 348-3491
- Mechanical and Materials Engineering: (305) 348-2569
- School of Computing and Information Sciences: (305) 348-2744

Important Contact Information
Web site: [http://www.eng.fiu.edu](http://www.eng.fiu.edu)

Admissions: (305) 348-2363
College of Engineering and Computing – Undergraduate Admissions: (305) 348-1635
Campus Resources: (305) 348-2973
Career Services: (305) 348-1281
Financial Aid: (305) 348-2489
Graduate School: (305) 348-2455
International Student Services: (305) 348-1913
Registrar’s Office: (305) 348-2320
Scholarships: (305) 348-1869
Tuition Waivers: (305) 348-1869

Professional Certificate in Sustainable Construction
This interdisciplinary Professional Certificate provides both traditional students and practicing professionals with a unique learning experience that enhances their design and management capabilities in the emerging field of sustainable building design and construction. The program focuses on an integrated system approach to apply basic engineering science/architectural principles to practical applications through interdisciplinary teamwork. Interested applicants must contact the Program Coordinator prior to registering for the program. This certificate program is open to both degree- and non-degree seeking students.

The Certificate will be awarded to a student who successfully demonstrates competency in:

**Four Core Courses**
- EML 4460 Mechanical Engineering Systems and Energy Utilization 3
- BCN 4570 Sustainable Approach to Construction 3
- ARC 3937/5939 GreeN: Designing for Sustainability 3
- CGN 4910 Sustainable Building Engineering 3

**One Interdisciplinary Design Course**
(registered under one of the following discipline courses)
- EML 4905 Senior Design Project – GL 3
- BCN 4910 Senior Project 3
- ARC 4114 Special Projects 3
- CGN 4802 Senior Design Project 3

**One Elective**
(choose one of the following courses)
- EML 4911 Undergraduate Research Projects 3
- BCN 4911 Special Projects 3
- CGN 4911 Undergraduate Research Projects 3
- ARC 3622/5623 Design Ecology and Technology 3
- IND 4627/5628 Sustainable Interior Design Practices 3

**NOTE:** The program is co-listed in the undergraduate program catalogs under both College of Engineering and Computing and College of Architecture and The Arts.

**Course Descriptions**

**Definition of Prefixes**
EIN - Engineering General; EGS-Engineering Support; EIN - Engineering; ESI - Engineering Systems Industrial; IDS-Interdisciplinary Studies.
F-Fall semester offering; S-Spring semester offering; SS-Summer semester offering.
Courses that meet the University’s Global Learning requirement are identified as GL.

**EGN 3124 Computer Assisted Drawing and Design**
(3). Application of computer assisted design technology to product design, feasibility study and production drawing. (F,SS)

**EGN 5435 Product Modeling**
(3). Life cycle product data, geometry and form features, product information models and modeling techniques, product modeling systems, and product data standards. Prerequisites: EGN 3124 or equivalent.

**EGN 5540 Quality and EH&S Management Systems**

**EGN 5644 Commercializing Innovation**
(3). Product development/process, innovation, commercialization; needs analysis; market segmentation; value proposition; prototyping, packaging and branding; modeling costs and margins; hands-on practice. Prerequisite: Permission of the instructor.

**EGS 5620 Enterprise Systems Configuration**
(3). Enterprise systems overview; major enterprise functions; standard operation procedures; system configuration and parameters; master data; user interfaces and reports; and hands-on experience. Prerequisite: Permission of the instructor.

**EGS 5621 Enterprise Systems Collaboration**
(3). Collaborative engineering and environment; decision processes; changes management; virtual enterprise operation systems; and hands-on experience with a commercial enterprise operation system. Prerequisite: EGS 5622.
EGS 5622 Enterprise Systems Integration (3).
Enterprise architectures; work flow modeling and design; systems integration methodology; vertical and horizontal integration; master data analysis and integration; and hands-on experience. Prerequisite: EGS 5620.

EGS 5623 Enterprise Systems Optimization (3). Supply networks overview; interactive supply network planning; optimal systems and process design; optimization techniques and heuristics; master and transaction data transfer; and hands-on experience. Prerequisite: EGS 5622.

EIN 1396C Basic Industrial Shop and Manufacturing Practices (3). Fundamentals of basic capabilities and requirements for a modern shop or industrial manufacturing facilities. Rudiments of safety requirements, wood technology, metal technology and plastic technology.

EIN 2100 Introduction to Industrial and Systems Engineering (1). A historic review of ISE origins, definition of role, functions and contributions of the IE in industry. Professional development opportunities. Practice communication skills. Seminars.

EIN 3235 Evaluation of Engineering Data I (3). Analysis of industrial data and subsequent characterization of industrial processes. Prerequisite: MAC 2312. (F,S,SS)

EIN 3331 Quality Control (3). Modern concepts for managing the quality function of industry to maximize customer satisfaction at minimum quality cost. The economics of quality, process control, organization, quality improvement, and vendor quality. Prerequisite: EIN 3235. (S,SS)

EIN 3365 Facilities Planning and Materials Handling (3). Application of methods and work measurement principles to the design of work stations. Integration of work stations with storage and material handling systems to optimize productivity. Prerequisites: EGN 3124 and ESI 3321. (F)

EIN 3390 Manufacturing Processes (2). Study of interrelationships among materials, design and processing and their impact on workplace design, productivity and process analysis. Prerequisite: EGN 3365. Corequisite: EIN 3390L. (F,S,SS)

EIN 3390L Manufacturing Processes Laboratory (1). Experiments are conducted using the machines, equipment and tools in the laboratory to provide students with hands-on experience on product design, process planning, fabrication and quality assurance. Corequisite: EIN 3390. (Lab fees assessed). (F,S,SS)

EIN 3600 Industrial Automation (2). Basic concepts of industrial automation and robotics. Performance characteristics, criteria for use, planning, selection, and implementation of computer automated equipment. Open to non-majors. Prerequisite: ESI 3161. Corequisite: EIN 3600L. (F)

EIN 3600L Industrial Automation Lab (1). Experiments in the use of CNC machines and robots demonstrating performance characteristics of CNC equipment and robotic arms. Corequisite: EIN 3600. (Lab fees assessed). (F)

EIN 3949 Industrial Engineering Co-Op (1-3). Entry level work experience as an Industrial Engineering intern. Jointly supervised by IE and industry personnel. Written report required. Student must obtain approval from IE faculty and sign up for course before starting work. Prerequisite: Approval of advisor. (F,S,SS)

EIN 4102 Collective Bargaining in Industrial Systems (3). A comprehensive study of collective bargaining with emphasis upon the private sector. Included will be negotiations and scope of contracts, day-to-day contract administration, and major bargaining issues. Prerequisite: Senior Standing (SS)

EIN 4103 Fundamentals of Engineering Regulation (3). A survey of the legal and regulatory requirements encountered by engineers. Included will be patents, antitrust, safety environmental, compliance, labor laws, product liability and global issues. Prerequisite: Senior standing.

EIN 4104 Introduction to Engineering Management (3). Organization of engineering systems including production and service organizations. Inputs of human skills, capital, technology, and managerial activities to produce useful products and services. Prerequisite: Permission of advisor.

EIN 4116 Industrial Information Systems (3). The integration of information flows and data bases with the production planning and control systems into productive and manageable systems. Prerequisites: EIN 3235 or permission of the instructor. (F)

EIN 4122 Industrial Marketing (3). The performance of business activity that directs the flow of goods and services from producer to industrial user. Covers new product development, marketing research, sales engineering, pricing, distribution, and promotion. (F)

EIN 4214 Safety in Engineering (3). Introduces occupational safety and health hazards associated with mechanical systems, materials handling, electrical systems, and chemical processes. Illustrates controls through engineering revision, safeguarding, and personal protective equipment. Emphasis placed on recognition, evaluation and control of occupational safety and health hazards. Prerequisites: EIN 4314 or permission of the instructor. (S)

EIN 4220 Introduction to Total Quality Management (3). Fundamentals of TQM and its historical development. Integration of QC and management tools, QFD, Benchmarking for scientific management. Prerequisite: Permission of advisor.

EIN 4243 Human Factors Engineering (2). Examination of the ways to fit jobs and objects better to the nature and capacity of the human being. Lectures will review man’s performance capability, singly and in groups, in interacting with his work environment. Stresses the practical application of human factors principles. Prerequisite: EIN 4314. Corequisite: EIN 4243L. (F)

EIN 4243L Human Factors in Engineering and Design Laboratory (1). Experiments are conducted which measure human factors indicators and differences by age, sex, and race, as well as physiological and anatomical differences. Corequisite: EIN 4243. (Lab fees assessed). (F)
EIN 4261 Industrial Hygiene (3). A continuation of Safety in Industry. An introduction to OSHA regulations on health hazards. Noise, radiation, and dust problems in industry. Special hazards with solvents, asbestos, lead, silica, and other chemicals. OSHA compliance procedures. Prerequisite: Senior standing. (S)

EIN 4314 Work Design and Industrial Ergonomics (2). The analysis, design, and maintenance of work methods. Study of time standards, including Pre-Determined time standards and statistical work sampling. Prerequisites: EGN 3124, EIN 3235 or equivalent. Corequisite: EIN 4314L. (S)

EIN 4314L Work Design and Industrial Ergonomics Laboratory (1). Experiments in the different Work Design techniques including Performance Sampling, Time Studies, Pre-Determined Time Systems and Workplace Design. Corequisite: EIN 4314. (Lab fees assessed). (S)

EIN 4326 Industrial Research and Development (3). Research and development for new product strategies, technological assessment, patent and product liability, and sales engineering. An independent study product will be required by each student. Prerequisite: Senior status.

EIN 4328 Introduction to Engineering Entrepreneurship (3). Fundamentals of engineering entrepreneurship; entrepreneurial process, identification of opportunities, starting and managing the venture, and development of business plans.

EIN 4333 Productivity Planning (3). The improvement of productivity as a functional activity of the enterprise. Productivity definitions, measurement, methodologies, and reporting systems. Prerequisites: EIN 4314, ESI 3161, and statistics.

EIN 4334 Production Planning and Control (3). Production systems, demand forecasting, capacity planning, master production planning, material requirements planning, shop floor control, and assembly line balancing. Prerequisites: EGN 3613 and ESI 3321. (S)

EIN 4351 Introduction to Industrial Financial Decisions (3). Fundamental concepts of industrial financial decisions, financial planning and analysis tools, justification for industrial capital investments, and intermediate and long-term financing options. Prerequisite: EGN 3613.

EIN 4387 Technology Assessment (3). Development of systematic efforts to anticipate impacts on society that may occur when a technology is introduced, extended, or modified. Prerequisites: Senior standing in Engineering, ESI 3161 and Statistics.

EIN 4389 Technological Forecasting (3). Emphasis on forecasting future trends and specific developments in the area of capabilities and needs. Prerequisites: Senior standing in Engineering and EIN 4334.


EIN 4440 Introduction to Technology Entrepreneurship (3). An introduction to theories, concepts, and practices of entrepreneurship. Students will produce feasibility analyses, learn to develop and analyze new ventures, and be introduced to business plans.

EIN 4441 Engineering Business Plan Development (3). This course is designed to help students develop an effective implementation plan for a new business venture. Prerequisites: ENT 4113 or EIN 4440.

EIN 4451 Lean Production Systems (3). Design and analysis of lean manufacturing systems, small lot production, setup-time reduction, continuous improvement, six-sigma, push and pull manufacturing, production planning and scheduling. Prerequisites: ESI 3231, EIN 3235.

EIN 4933 Special Topics in Industrial Engineering (2-3). Permits in-depth study in areas relating to specific student interests, recent advances, and problems in industrial technology or systems. Prerequisites: Senior standing, consent of faculty advisor and approval of department chairman.

EIN 4941 Undergraduate Industrial and Systems Engineering Internship (1). To provide undergraduate students with work experience under approved industrial supervision. Prerequisite: Department chairperson’s approval.

EIN 4949 Co-op Work Experience (1-3). Practical Co-op work experience under approved industrial supervision. Written report required at the conclusion of the work assignment. Prerequisite: Permission of department chairperson.

EIN 5106 Regulatory Aspects of Engineering (3). A survey of the legal and regulatory requirements encountered by engineers. Included OSH Act, NIOSH, ADA, EEOC, Worker’s Compensation and Product Liability. (SS)

EIN 5226 Total Quality Management for Engineers (3). Fundamentals of TQM and its historical development. Integration of QC and management tools, QFD, benchmarking, experimental design for scientific management. (F,S)

EIN 5244 Cognitive Engineering (3). Advanced topics in human factors and cognitive engineering. Theoretical aspects of applied situation awareness and decision making, and applications in a variety of engineering domains. Prerequisite: EIN 4243.

EIN 5249 Occupational Biomechanics (3). Study of the theoretical fundamentals for the mechanics of the body. The link system of the body and kinematic aspects of body movement including applications of biomechanics to work systems. Prerequisites: EIN 4314 Work Design and Industrial Ergonomics or equivalent. (S)
EIN 5256 Usability Engineering (3). The usability aspects of software systems design and testing. The theory of interface design for usability and the methods and techniques for designing and testing technology interfaces. Prerequisite: Permission of Instructor.

EIN 5322 Engineering Management (3). Organization of engineering systems including production and service organizations. Inputs of human skills, capital, technology, and managerial activities to produce useful products and services. (F,S)

EIN 5332 Quality Engineering (3). This course examines quality control from an engineering standpoint. It covers ways to meet the challenge of designing high-quality products and processes at low cost. Prerequisites: EIN 3331 or equivalent. (S)

EIN 5346 Logistics Engineering (3). Concepts and tools for effective design and management of supply chain systems. Includes logistics strategies, inventory management, customer service, supply chain integration and logistics network design. Prerequisite: Consent of Instructor. (SS)

EIN 5359 Industrial Financial Decisions (3). The use of financial techniques and data in planning, controlling and coordinating industrial activities. This course will familiarize the student with accounting concepts and analytical methods. Prerequisite: EGN 3613. (SS)

EIN 5367 Design of Production Systems (3). The design of an industrial enterprise including feasibility, plant layout, equipment specifications, auxiliary services, economics and scheduling. Prerequisite: EIN 3365.

EIN 5605 Robotic Assembly Cell (3). Concepts of robot manipulation and sensing, part design for robotic assembly, planning manipulator trajectories, machine vision, robot programming language, cell control, and material transfer. Prerequisite: EIN 3600.

ESI 1622 Introduction to Engineering Software Applications (3). Hands-on experience with software packages such as Autocad, MS Word, Excel, PowerPoint, Access, Windows XP, and industrial applications of the Internet. Prerequisite: High school students in dual enrollment programs.

ESI 3161 Software Tools for ISE (3). Basic concepts of microprocessors; an overview of computer architecture, local area networks, micromainframe linking, and operating systems as they apply to industrial systems.

ESI 3321 Operations Research I: Deterministic Models (3). Modeling principles with emphasis on linear programming and extensions. The simplex procedure and its application through computer software packages. The analysis and interpretation of results in decision making. Prerequisites: MAC 2312, permission of the instructor. (F)

ESI 3523 Simulation Models of Industrial Systems (2). Simulation methodology, design of simulation experiments, implementation of simulation effort through computer software. Application to the solution of industrial and service system problems. Prerequisites: COP 2270 or equivalent, ESI 3161, ESI 3321 and EIN 3235 or equivalent. Corequisite: ESI 3523L. (S)

ESI 3523L Simulation Models of Industrial System Laboratory (1). Simulation Modeling on a microcomputer. Analyze and validate design models using both a general purpose programming language and a special-purpose simulation language. Corequisite: ESI 3523. (S)

ESI 4244 Evaluation of Engineering Data II (3). Application of statistical analysis in engineering practice, design of engineering experiments, and decision making. Study of prediction, tolerance intervals. Use of computer tools. Prerequisites: EIN 3235 or equivalent.

ESI 4317 Computer Algorithms for Operations Research (3). Discussion and implementation of a collection of computer algorithms essential for the O.R. researcher and consultant. This collection of algorithms includes both deterministic and stochastic models. Computer exercises. Prerequisites: ESI 3321 or equivalent. (S)

ESI 4322 Operations Research II: Stochastic Models (3). Modeling principles with emphasis on applications of Markov Chains, queuing models, systems reliability, Bayesian decision analysis. Prerequisites: ESI 3321, EIN 3235 or equivalent. (S)

ESI 4452 Project Management Systems Design (3). Project planning, scheduling and control using activity network logic. System development techniques and strategies. Prerequisite: Permission of the instructor. (F)

ESI 4554 ISE Systems Design (3). To integrate all prior ISE required courses into a cohesive and consistent professional philosophy. Prerequisite: Permission of instructor. (S)

ESI 4556 Industrial and Systems Engineering in the Office (3). Paperwork reduction, overhead and expense cost containment, and white collar productivity through office automation and systems analysis.


ESI 5456 Productivity Management in the Global Organization (3). Analysis of productivity management strategies. Major issues in performance and productivity management, domestic and global outsourcing, international labor standards and trade policies. Prerequisites: EIN 4214 or equivalent.

ESI 5522 Simulation Models of Engineering Systems (3). Simulation Methodology; design and implementation of models of engineering systems using computer software; case studies. Prerequisites: STA 3033 or EIN 3235 or equivalent and COP 3175 or equivalent.

ESI 5602 Engineering Data Representation and Modeling (3). The course will cover the life cycle of designing, developing, and implementing engineering database systems by applying the IDEFLx methodology. Prerequisite: Permission of Instructor.

IDS 3163 Global Supply Chains & Logistics – GL (3). Global supply chains and their interactions with all facets of business and society. Design issues and operation issues are investigated using simulation models and case studies.

Center for Diversity in Engineering and Computing

Masoud Milani, Director and Professor, School of Computing and Information Sciences
Francisco Fins, Program Coordinator
Jorge Nosti, Program Coordinator
Beatriz Oria, Program Specialist
Rebecca Ramos, Program Coordinator
Katina Vallina, Program Specialist

South Florida’s distinction as a multi-cultured, multi-lingual region has long been a diverse source of talent for FIU, particularly in the College of Engineering and Computing. In response to the challenge of attracting this diverse community to science and engineering, the College of Engineering and Computing has created a special center for Diversity in Engineering and Computing.

By building sound foundations in sciences and mathematics, the Center helps to prepare young students to deal with the rigors of higher-level education, and Engineering and Computing in particular. Currently the Center is actively engaged in a number of special programs as a service to the community and the University:

Florida Action for Minorities in Engineering (FLAME) This is a cooperative program between Miami Coral Park Senior High School and Florida International University aimed at introducing the profession of engineering to high school students, and to identify, select, enroll and retain minority students in the engineering field. Senior High School students also registered for dual enrollment classes at FIU.

Florida/Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP) This is a National Science Foundation funded program in association with Florida Agricultural and Mechanical University (FAMU), the leading institution. This program focuses on engineering, math chemistry, biology, physics, and computer science undergraduate students. Participants receive scholarships, during the entire academic year based on high GPA and being a full time student. Opportunities for summer internships are available.

Junior Engineering Technical Society (JETS) (TEAMS) The JETS Test of Engineering Aptitude, Mathematics and Science (TEAMS) is an academic problem-solving competition, that serves all public and private high schools within our geographical area with focus on a one day activity at Florida International University.

(UNITE) A collaborative effort between Florida International University, the U.S. Army, and the Junior Engineering Technical Society. The JETS UNITE Program’s goal is to increase the number of underrepresented students in the field of engineering, to improve the performance of the students in their SAT/ACT exams, develop resourceful, self-motivated well rounded graduates who will be responsible and well adjusted citizens.

ENLACE/Miami The Children Trust This program is funded by The Children Trust and provide after school and summer programs for 650 children (ages 7-17) residing in the Sweetwater, Doral and West Kendall areas. The after school program will offer literacy support through individualized software-based increasing intervention, social skills development, and health fitness education. The summer program will offer students the unique opportunity to attend classes on a university campus.

GEAR UP Homestead The GEAR UP Homestead project assists a maximum number of students living within the Homestead area achieve a college career, while implementing a self-sustaining system to continuously duplicate the process. Homestead Florida is faced with serious issues that require assistance from other communities, such as poverty, lack of jobs, and problems related to disadvantaged societies. Fortunately, with the development of the GEAR UP Homestead Partnership Plan as well as the aide to public, private and governmental institutions, the targeted cohort students of the Homestead area will be able to reach their maximum potential through a college education. Partners such as the US Department of Education will supply a vast portion of the resources needed to perform this project. Aspira, a non-profit organization, is dedicated to creating leadership through education for those who are disenfranchised, or socially and economically disadvantaged. Another important team player is the Non-Violence Program of Miami, contributing the idea that knowledge is the best weapon against violence, and motivating young people to engage in positive action to make our communities safer.

The GEAR UP project is made of several components that contribute to a wider reach into insuring that a maximum result is gained by everyone involved. Among these components are in-school tutoring and assistance programs. The Summer Enrichment Program offers an alternative way of spending those long summer days. The teacher training Development Program, as well as PRISM (Program of Industry Supported Mentorship’s) enrich teachers with the right preparation to confront all kinds of situations. Perhaps the most important aspect that will contribute to the outcome of the child is the parental influence and family involvement into their success. In a fast-paced and demanding society, this is often a difficult threshold to cross. Parent Involvement Program (PIP) encourages parents to have a positive active role in their child’s every day awareness of the future. Education begins in the home and ends in the child’s decision to instill a safe and productive future. The powerful drive needed to assist the process of growth and awareness is the very reason for the existence of programs such as GEAR UP.

The mission of the partnership addresses the needs of the student by bringing the necessary awareness and readiness for a successful college education. To succeed such advancement, GEAR UP has established a mission, goals, objectives and outcomes that will serve as the foundation for a successful program. The dedication of the partnership as well as a Vision Statement that clearly unifies the community to serve its future provides an inspiration: that the education of today paves the road towards tomorrow’s success.
Research and Development Centers

Advanced Materials Engineering Research Institute (AMERI)

Chunlei (Peggy) Wang, Interim Director and Associate Professor, Mechanical and Materials Engineering

The Advanced Materials Engineering Research Institute provides an open access equipment infrastructure to support materials research and engineering over a broad range of technology and capabilities. The Institute provides analytical instrumentation, materials characterization, and process development laboratories to support faculty and industry in the development and characterization of new materials over the continuum from the nanoscale to bulk materials.

The analytical Instrumentation Laboratory contains two field emission scanning electron microscope (FESEM), a 200 kev Transmission Electron Microscope (TEM), Atomic Force Microscope (AFM), X-ray diffraction, thermal (DSC, TGA, DMA, dilatometer flush diffusion, and mechanical testing (uniaxial/biaxial Instron). Process Development laboratories for ceramic processing (sol-gel, tape casting, milling), and thermal processing (air, vacuum, hydrogen, controlled atmosphere furnaces) are available to support faculty and student researchers.

The Institute consists of the Motorola Nanofabrication Facility, which is supported by a class 100 clean room and nanofabrication capabilities including e-beam lithography and optical photolithography. Fabrication of nano/micro electromechanical systems (N/MEMS) can be accomplished by a combination of nanolithography, focused ion beam (FIB) micro machining, nano imprinting, reactive ion etching, and thin film deposition by a variety of techniques (e-beam, sputtering, filament evaporation, cvd).

In addition to supporting research within the graduate program in materials science within the Department of Mechanical and Materials Engineering, the Institute supports faculty across all departments (physics, chemistry, geology, biology, electrical and computer engineering and biomedical engineering) in materials based research.

Research and Support Staff

Chunlei (Peggy) Wang, Interim Director and Associate Professor, Mechanical and Materials Engineering
Arvind Agarwal, Professor, Mechanical and Materials Engineering
Jihua Chen, Professor, Mechanical and Materials Engineering
W. Kinzy Jones, Professor, Mechanical and Materials Engineering
Chenzhong Li, Associate Professor, Biomedical Engineering
Wenzhi Li, Associate Professor, Physics
Norman Munroe, Associate Professor, Mechanical and Materials Engineering
Surendra Saxena, Professor, Mechanical and Materials Engineering
Yuriv Vlasov, Research Engineer
Yesim Darici, Associate Professor, Physics
Watson Lees, Associate Professor, Chemistry

Kevin O’Shea, Professor, Chemistry
Neal Ricks, AMERI Manager

Applied Research Center (ARC)

John R. Proni, Ph.D., Executive Director
David Roelant, Ph.D., Associate Director of Research for Environment & Water
George Philippidis, Ph.D., Associate Director of Research for Energy
Jerry Miller, Associate Director of Security, Policy and Technologies
Richard Burton, PMP, Associate Director of Business Programs
Gloria Dingeldein, Associate Director of Grants
Leonel Lagos, Ph.D., PMP, Director of Diversity and Workforce Development & Training

ARC’s mission is to solve complex issues in environmental stewardship, energy, and defense through innovative, cooperative research and entrepreneurship. In carrying out this mission, the Applied Research Center is committed to providing training opportunities to the University’s uniquely diverse student body under the mentorship of the Center’s experienced engineers and scientists.

ARC’s vision is to be a leading university-based, applied research institution that provides real-world solutions throughout the Americas and globally that will enable Florida International University to become a leading research institution with well funded programs.

Environment & Water – ARC provides a full spectrum applied environmental and water research. With over 260 projects and $90M of funding in this area since the Center’s founding in 1995, ARC is a nationally recognized leader. Examples of science research include: development and testing of remediation technologies to stabilize toxic metal contaminants in soils; new analytical methods for perchlorate measurements in fish tissue; and the modeling of the energy-dependent, absorption and transmission of infrared light through human tissues for safety standards and for new medical imaging technologies. In technology development ARC has developed patents and other intellectual property such as: automated monitoring systems for sampling ground and surface water as well as abandoned buildings contaminated with radioactivity; novel new sensors for contaminants in soils and groundwater (e.g., Hg and U); improved scabbling systems for removing surface contamination from floors, walls and large bore piping; sensor systems for UGVs and UAVs; and much more. ARC is the one of only three major environmental technology test and evaluation centers in the U.S. ARC has tested over 250 new, commercial technologies in order to assess and improve their effectiveness prior to deployment across the country. Several States including Texas have implemented ARC’s rigorous environmental technology testing methodology. ARC is a leading university research program in waste management and pollution prevention, with $1-2M per year of funding and has certification in hazardous waste management. ARC currently assists DOE in the cleanup of the Nuclear Weapons Complex by developing technologies to remediate contaminated soil and groundwater plumes; technologies to clean and dismantle contaminated nuclear
facilities; and those to characterize, retrieve and treat radioactive and mixed wastes. **Water research** focuses on advanced groundwater and surface water modeling for clients worldwide including contaminated sites across the U.S. such as the Everglades. 1000 students to date have had "hands on" research mentoring and training at ARC in the water and environmental area. In collaboration with ARC’s Security, Policy and Technologies scientists ARC has supported the U.S. Army by developing, fabricating and demonstrating several environmental technologies across Latin America (e.g., wetlands design and construction, mobile water purification systems). More on ARC’s Environmental and Water research can be found at www.arc.fiu.edu/environment&water.

**Renewable Energy and Biofuels** – The country’s over-dependence on imported oil and increasing concern about global warming necessitate the development of domestic renewable energy and fuel sources and the adoption of energy efficiency and conservation steps. In light of the country’s urgent need for enhanced energy security and reduced greenhouse gas emissions, ARC is developing technologies covering the full spectrum of sustainable energy resources from solar and wind to biomass, biofuels, and fuel cell systems. Capitalizing on the national emphasis on clean and renewable energy, ARC has enhanced its research and technology development activities in various energy fields and has created an affiliate center, the Center for Energy and Technology of the Americas (CETA) to promote energy integration and technology transfer within the Western Hemisphere. ARC is developing technologies for production of sustainable biofuels: (1) Ethanol from cellulosic biomass, such as sugarcane bagasse and wood waste, using biochemical and thermochemical processes, and (2) Biodiesel from non-edible oils (jatropha) and from native algae. In the areas of hydrogen and fuels cells, ARC investigates the production of hydrogen from biomass via gasification and biologically by microorganisms, while looking for ways to manufacture cost-competitive high temperature PEM fuel cells. ARC possesses pilot-scale facilities for biomass gasification and biodiesel production, which serve the needs of the public and private sectors for testing and demonstrating new technologies. Moreover, in collaboration with FIU’s Business School, the ARC has formed the Energy Business Forum (EBF), which promotes the development on new energy markets and their integration into the existing fossil energy infrastructure. The EBF has been organizing stakeholder conferences to facilitate dialogue, exchange of ideas and partnerships.

**Security, Policy and Technologies** – ARC conducts advanced research in security policy; renewable energy technologies and other security/defense technologies. ARC's scientist and engineers conduct a variety of research work applicable for the DOD, DHS and other private entities involved in security and defense issues. ARC’s researchers have linguistic and cultural skills needed to implement solutions in the field. Our mission is to solve international problems in the field through integration of technology and policy development in three areas—Applied Technologies, Security and Stability Studies, and Security Technologies.

**Applied Technologies** focuses on researching, demonstrating, validating and implementing renewable energy and environmental technologies in the field in order to develop sustainable solutions in the following areas: 1) Rural electrification, 2) Biomass gasification for thermal and electrical energy production, 3) Constructed wetlands as a treatment for waste water, 4) Solar-power and solar-powered water purification systems, 5) Micro-hydroelectric generation, 6) Bio-fuels production and use (“field to fuel”) and 7) International Waste-to-Energy solutions.

**Security and Stability Studies** addresses security and policy research throughout Latin America and the Caribbean. Using a “network of experts approach”, a multidisciplinary group of collaborative experts from more than 30 universities throughout the hemisphere, focus on emerging security threats throughout the world. ARC sponsors colloquia, conferences and research on stability and security issues, and delivers analytical reports that combine economic, geopolitical, social and scientific analysis, as well as recommendations to our clients.

**Security Technologies** (formerly Defense Technologies) is an expanding area of research that includes research in development and implementation of security technologies in the fields of acoustic systems, sensor systems, mobile platform robotics, artificial intelligence and information technology, detection systems, advanced power systems for remote sensors and development/applications of UAVs. During the past three years, the Center has conducted research on twelve projects with an overall value of more than $4M. Clients such as AFOSR, AFRL, ARO, MDA, DARPA, and NRO have partnered with ARC on research, which includes: integration of sensors and imaging systems into autonomous monitoring technologies, such as remote ground stations and unmanned aerial vehicles (UAVs) and unmanned ground vehicles (UGVs); Computational Fluid Dynamics analyses and experimental research for micro-channel nozzle flow for space vehicle thrusters, hypersonic flow for Scramjets, model verification of ice formation on wings, and micro-channel cooling of electronic components; and numerical simulation of micro-bubble drag reduction for applications in naval ships and submarines.

**Workforce Development and Training** – The DOE-FIU Science and Technology Workforce Development program is an innovative program to create a “pipeline” of FIU STEM (science, technology, engineering, and math) underrepresented students specifically trained and mentored to enter the DOE workforce in technical areas of need. The main objective of the program is to provide a unique integration of FIU course work, DOE field work, and “hands on” training and mentoring at ARC. It is envisioned that once our DOE Fellows graduate from this program they will enter DOE-EM’s Professional Development Corps Program and/or work for DOE’s contractor firms. To date, a total of 33 FIU underrepresented students have joined the program. The students are officially inducted into the program and vested the name of **DOE Fellows** in a special Induction Ceremony celebrated during the Fall semester. DOE Fellows also have internship opportunities at DOE National Laboratories and DOE sites around the country. Since the program’s initiation in 2007, a total of 14 DOE Fellows have participated in research internships at Oak Ridge National Laboratory, Idaho National Laboratory, Pacific Northwest National Laboratory, and DOE-HQ in Washington DC. In addition, our DOE Fellows directly
support DOE contractors performing environmental remediation around the DOE Complex. Furthermore, this program enables undergraduate students to pursue the M.S. and Ph.D. degrees by providing Research Assistantships. So far, a total of 10 DOE Fellows have obtained B.S. degrees and have transitioned to M.S. programs at FIU.

ARC is committed to the education and development of FIU students and has developed a Student Steering Committee (SSC) that oversees the academic and research progress of each student. This committee also conducts interviews and evaluates applicants for the program. ARC is working closely with federal, state agencies, community colleges and other universities to provide training in alternative energy areas such as: solar, biomass, nuclear and weathering. This Energy Systems Training Network under the Florida Energy Systems Consortium (FESC) will help to develop a 21st century “green workforce”.

Doing Business with the Applied Research Center – ARC’s employees are drawn from a wide segment of the commercial, government, and academic arenas to collectively utilize their experience and expertise to support the needs of FIU’s clients. Our operating philosophy recognizes and accommodates the critical performance characteristics of government and commercial activities, while exercising the benefit of its cost structure in a way that serves both client interests and those of the University and its students. Our staff is fully engaged in the project and program activities assigned. The critical difference in the ARC’s structure is the project management and administrative processes and structures that have been put in place to serve its clients. The Center has executed work for federal agencies, state and local governments, and commercial entities, in large part through task-based contracts. For instance, in working with the U.S. Department of Defense, the Center has acted as both the prime contractor and as a sub-contractor/consultant for commercial partners, serving to streamline the process.

For more information on FIU’s ARC, please visit www.arc.fiu.edu or email us at arc@arc.fiu.edu or call 305-348-4238.

Bioinformatics Research Center (BioRG)

Giri Narasimhan, Director and Professor, School of Computing and Information Sciences

The mission of this research group is to work on problems from the fields of Bioinformatics and Biotechnology. The group’s research projects includes Pattern Discovery in sequences and structures, micro-array data analysis, primer design, probe design, phylogenetic analysis, image processing, image analysis, and more. The group builds on tools and techniques from Algorithms, Data Mining, Computational Statistics, Neural Networks, and Image Processing.

Center for Advanced Distributed Systems Engineering

Xudong He, Director and Professor, School of Computing and Information Sciences

Another of our research efforts is the Center for Advanced Distributed System Engineering (CADSE). Its mission is to establish a streamlined research, technology exploration and advanced training program in the field of distributed and Internet-based computing. The Center’s R&D cover both theoretical and practical aspects of distributed software engineering, i.e. using engineering methods and technologies to tackle development problems of complex, reliable, and/or real-time distributed systems.

Center for Advanced Technology and Education (CATE)

Malek Adjouadi, Director and Associate Professor, Joint Appointment with Biomedical Engineering and Electrical and Computer Engineering

The vision of the NSF-CATE center at FIU is to foster a cross-disciplinary research and educational program as a catalyst for our undergraduates and graduates alike to develop their creative thinking by bringing in synergy the fields of applied information (signal and image) processing, neuroscience and assistive technology research. The CATE center focuses on new methodologies that (1) will enhance analysis and interpretation of signals and images in real-world applications; (2) will meet the impending needs in neuroscience as we elicit both the functional mapping of the brain, and the causality of key brain disorders; and (3) will result in new Human-Computer Interface (HCI) prototypes that address effectively the issue of Universal Accessibility, focusing on visual impairment and motor disability. Experimental results, as observed through clinical means or through system design evaluations and feasibility studies serve as means to redefine or re-evaluate our theoretical premises. The strong collaboration we have secured with our industry partners generates joint programs, student internships, clinical rotations, joint faculty appointments, and shared use of modern equipment and infrastructure. The overall mission of the CATE Center is thus to create a unified infrastructure to synergize imaging/signal processing research, while fostering an environment that supports cross-disciplinary initiatives in order to produce new scientific specialties relying on combinations of specific technologies, medicine, and computation. This environment as set is apt to ensure the anticipated success in meeting our students’ educational needs and research goals all the way to the Ph.D. level.

Research Areas

- Image and Signal Processing and Computer Vision
- Real-Time Assistive Systems and Human-Computer Interfaces
- Neuroscience: - EEG Brain Research – Functional Brain Mapping
- Biomedical Applications in Flow Cytometry and Confocal Microscopy
Related Laboratories and Facilities of the CATE Infrastructure

With major funding from the National Science Foundation and the Office of Naval Research, the CATE center has helped establish the following laboratories.

1. EEG Brain Research Laboratory. Funded by NSFMRI – Housed within the Neuroscience Center at Miami Children’s Hospital.
2. Web-Design Laboratory. Funded jointly by ONR and NSF-MII – Housed within the Engineering Information Center Facility.
3. The Computer Training Laboratory – Housed in Graham Center with the Office of Multicultural Services.

Center of Emerging Technology for Advanced Information Processing and High-Confidence Systems (CREST)

Naphtali Rishe, Director and Professor, School of Computing and Information Sciences

The CREST center focuses on the following research areas: High-confidence reactive software systems, multidimensional-multimodal data modeling and query research, assistive technology research based on the design and development of real-time assistive systems, and advanced information processing with neuroscience applications. This multidisciplinary research and educational center serves as a resource for the education of underrepresented minority students as well as a driving force to increase diversity in graduate education, especially at the Ph.D. level in computer science and engineering.

Center for the Study of Matter at Extreme Conditions (CeSMEC)

Surendra Saxena, Director and Professor, Mechanical and Materials Engineering
Jiuhua Chen, Deputy Director and Professor, Mechanical and Materials Engineering
Yu Zhong, Assistant Professor, Mechanical and Materials Engineering
Andriy Durygin, Research Coordinator
Vadym Drozd, Research Assistant Professor
Selva Venilla Raju, Research Assistant Professor

CeSMEC’s mission is to study the behavior of materials at high pressures and temperatures. The range of research activities includes the study of planetary interiors and of matter at extreme industrial conditions.

CeSMEC is one of few facilities in the country where pressures are created to many million atmospheres and temperatures to several thousand degrees; the material is studied under such conditions with x-ray and ectoscopic techniques.

All materials are subject to three fundamental variables – the variables of temperatures, chemical composition, and pressure. Modern science has vigorously used only the first two variables in exploring nature and creating several amenities of modern civilization. Pressure, the third fundamental variable altering all states of matter, has been for years a relatively minor esoteric sub-field.
The creation of this center is providing FIU's graduate students and faculty the opportunity to perform fundamental and applied research in high-pressure physics, high-pressure chemistry, and materials science. The center is raising the infrastructure at FIU to the level required to initiate world-class research in an emerging area of science and engineering.

With recent additions of a Hydrogen-Storage Materials Research Facility and a large volume high pressure-high temperature equipment, researchers can perform synthesis of novel materials for a variety of industrial applications.

**Distributed Multimedia Information Systems Laboratory**

*Shu-Ching Chen, Director and Professor, School of Computing and Information Sciences*

The mission of the Distributed Multimedia Information System Laboratory (DMIS) is to conduct leading edge research in multimedia database systems, data mining, networking and wireless, GIS and Intelligent Transportation Systems. Other research areas of this effort include Multimedia Communications and Networking, Digital Library, 3D Animation, and Distributed Computing.

**Division of Corporate and External Programs**

*Caesar Abi Shdid, Director and Senior Instructor, Civil and Environmental Engineering*

The Division of External Programs (DEP) develops, promotes and manages academic programs offered under the rubric of Executive Engineering Education, Continuing Education, and Distance Learning in the College of Engineering and Computing. The DEP is managed by a director reporting to the Dean of Engineering & Computing. The director and staff of the DEP work with department chairs, center directors and faculty members to identify corporate and global partners; develop, promote and manage Executive Engineering Programs; weekend graduate programs for professional, Distance Learning Programs, and Continuing Education Programs; and identify new opportunities and new markets for all programs that are offered by the College of Engineering and Computing. Various categories of programs in which the DEP is involved include the following:

**Overseas Programs**

The international student transfer program (Dual Degree and Articulation Programs) allows undergraduate students from foreign universities to complete approximately 75% of their curriculum at home institution and the remaining 25% at FIU, and receive their undergraduate degree from both institutions. An articulation agreement assures the student’s ability to transfer courses taken at home institution to FIU such that FIU's core curriculum and other undergraduate program requirements are met.

All participants in the program proceed as a cohort through a lock-step curriculum of the selected courses. The local faculty from the host country is also involved in teaching to enrich the program by integrating the economic, cultural, social, political and legal issues of the host country in the curriculum.

The international student transfer program (Faculty Development Program) allows the foreign universities, mostly in Latin America, to send their MS degree recipient faculty member to complete their PhD education at FIU. These students complete their coursework and dissertations proposals at FIU and then return to their home institutions where they complete their dissertation work. Agreements between the two universities allow for a lot of assistance to the student’s while they are working on their dissertation.

**Corporate and Executive Programs**

The Corporate Programs are designed for an individual corporation leading to an academic degree, certificate or short-term executive development program. The programs are delivered on site and the program delivery is supported by providing infrastructure facilities. Corporate programs are designed to meet the specific educational and training needs of the corporate clients. Currently, we offer the following engineering certificate programs: “Lean Six Sigma”, “Six Sigma Green Belt”, “Six Sigma Black Belt”, “ISO 9001”, and “Supply Chain Management” certification program every semester.

**Continuing Education Programs**

The Continuing Education Programs are designed to meet the licensing and certification needs of individual professionals in the engineering and construction fields. The programs are delivered at various locations around Florida and online. The Continuing Education Programs can be conducted on site for companies. Currently, we offer the following continuing education programs: “FDOT Construction Training and Qualification Program (CTQP)”, “FDOT Maintenance of Traffic in Construction Zones (MOT)”, “Professional Engineering (PE) Licensing Exam Review Courses for the NCEES PE Civil, PE Mechanical, PE Electrical (Power), and PE Structural exams”, “Fundamentals of Engineering Exam (FE) Review Course”, “Florida General Contractor’s Exam (GC) Review Course”, “OSHA Training Certification Courses”, “LEED Exam Prep Course”, “Florida Laws and Rules Seminars”, and “Continuing Education Seminars (for PEs and GCs)”.

The division is raising the infrastructure at FIU to the level required to initiate world-class research in an emerging area of science and engineering.

With recent additions of a Hydrogen-Storage Materials Research Facility and a large volume high pressure-high temperature equipment, researchers can perform synthesis of novel materials for a variety of industrial applications.
Weekend Graduate Programs for Professionals

DEP offers professionals in South Florida the ability to complete their master degrees in an accelerated one-year program that is conveniently offered on Saturdays in Broward County and the Miami downtown area. These programs are specifically designed for working professionals who aspire to a graduate degree without interrupting their careers. DEP currently offers a Professional MS Engineering Management and a Professional MS Construction Management degree programs in this lock-step format.

Distance Learning Programs

The Florida Engineering Education Delivery System (FEEDS) is a statewide distance learning system providing access to graduate and undergraduate level engineering courses and programs to individual students anywhere and anytime, whether it is at home or the workplace. Courses are delivered through streaming video over the Internet; and fully on-line.

FEEDS offers engineering students and professionals with work and family responsibilities the flexibility to take courses around their busy schedules. It also provides convenience to those who are not within driving distance of an academic institution. It allows them to continue their professional development, which plays an important role in the growth of high technology industries.

Currently, students can select the necessary courses from FIU via distance learning to obtain a Master’s degree in Civil Engineering, Environmental Engineering, and Construction Management. Selected undergraduate courses are also available for the following undergraduate degree programs: Civil Engineering, Construction Management, Environmental Engineering, Mechanical Engineering, Electrical Engineering, and Computer Science.

A student taking a course through FEEDS must meet the same requirements as the student on campus and will earn the same credit as if he/she were to attend classes on campus. A student need not be enrolled in a graduate or undergraduate degree program in order to take a course. However, a non-degree seeking student who intends to seek admission to a program should be aware that no more than twelve (12) graduate or fifteen (15) undergraduate credits are allowed to be transferred into a program.

Engineering Information Center (EIC)

Hernan Bormey, Director

Create a technology that will help save lives or create your own website, simulate an electronic circuit, design a bridge, or just browse the Internet. The possibilities are endless at the Engineering Information Center.

The EIC helps faculty, scientists, researchers, and students to conduct cutting edge research and work on system designs, networking, scientific visualization, 3D Modeling, simulations, virtual reality, computer animation, and other computer and software applications.

The Center manages an array of Novell, Windows, and UNIX network servers that provide faculty, staff and students with the capacity to share valuable resources; therefore, fostering an atmosphere where collaboration and instruction grow with a synergy that is unique.

Beyond the college community, the EIC participates in sponsoring special outreach programs for the Miami-Dade County Public Schools by exposing young minds to latest technologies.

The EIC is also home to The Graphic Simulation Laboratory with focus on Scientific Visualization, 3D Computer Modeling, and Virtual Reality, which have helped researchers to develop a wide array of technologies, strategies, and information designs. GSL has collaborated with NASA, The Center for Super Computing Applications, National Science Foundation, Computational Science Institute, Shodor Organization, Macromedia, and Kellogg Foundation, just to mention a few. From hardware to software support to 3D modeling of a heart valve, the EIC delivers exceptional services with a personal touch.

Engineering Manufacturing Center (EMC)

Ibrahim Tansel, Interim Chairperson, Director and Professor, Mechanical and Materials Engineering
Mario Sanchez, Senior Engineer and Manager
Richard Zicarelli, Coordinator

The Engineering Manufacturing Center provides technical expertise in manufacturing to anyone in need of assistance. Typically the Center supports researchers, graduate and undergraduate students with projects requiring high-precision quality fabrication and requiring expert technical guidance. Undergraduate engineering students represent the largest group served. Students of all academic departments benefit directly through help with class projects, such as Senior Design (capstone) courses, critical components of all ABET accredited Engineering programs in the College. Other major undergraduate projects supported include the Mini-Baja, Mini-Submarine and Robot Competitions. Graduate students regularly request fabrication assistance with experimental devices, tools and fixtures. The Center’s main facility supports the College’s academic departments’ general fabrication needs, including equipment repair, assembly, fixturing, installation, etc. An auxiliary EMC-supervised machine shop is available for student hands-on project work.

The Center also provides technical services to the outside community such as entrepreneurial consulting in product design and development and sub-contract fabrication work. Companies served by the EMC range from entrepreneurial to the well-established, some of which include aerospace, automotive, marine, medical and consumer product manufacturers. The Center runs state-of-the-art CAD/CAM software and operates a diverse array of rapid prototyping equipment combined with CNC capabilities providing a wide variety of fabrication processes. In addition, the Center can perform inspection, measurement and reverse engineering capabilities through its automated measurement equipment.

For more information, contact the EMC by calling Mr. Richard Zicarelli (305-348-655) or Mr. Mario Sanchez (sanchem@fiu.edu), or refer to the center’s website at http://www.eng.fiu.edu/ emc.
Eugenio Pino and Family Global Entrepreneurship Center

Jerry Haar, Executive Director

The Eugenio Pino and Family Global Entrepreneurship Center, founded in 2003 in the College of Business at Florida International University, fosters entrepreneurship throughout South Florida and internationally. The Pino Center provides the FIU and local communities with the knowledge and networks that enable them to reach their entrepreneurial objectives of designing, launching and nurturing successful new ventures and assisting established innovative enterprises in moving to the next level. Activities include: workshops and webinars, a business plan competition, a yearly conference on venture capital in the Americas, a venture mentor service, and a publication series, including working papers. Student and faculty in the Department of Management and International Business, as well as other departments and other schools and colleges within the University, are invited to participate in the programs and activities of the Pino Entrepreneurship Center. For more information, visit www.entrepreneurship.fiu.edu.

High Performance Database Research Center

Naphtali Rishe, Director and Professor, School of Computing and Information Sciences

One of our research efforts is the High-Performance Database Research Center (HPDRC). HPDRC conducts research on such theoretical and applied issues as Internet-distributed heterogeneous databases, database design methodologies, database design tools, information analysis, multi-media databases, database languages, data compression, spatial databases, and data visualization. The Center also designs specific database systems for highly complex applications.

International Hurricane Research Center (IHRC)

Stephen P. Leatherman, Director
Kegi Zhang, Laboratory for Coastal Research, Co-Director
Shahid Hamid, Laboratory for Insurance, Financial and Economic Research, Director
Arindam Gan Chowdhury, Laboratory for Wind Engineering Research, Director and Assistant Professor, Civil and Environmental Engineering
Dario Moreno, Laboratory for Social Science Research, Director

Serving the state of Florida, the IHRC is a Type I interdisciplinary research center focused on the mitigation of hurricane damage to people, the economy, and the built and natural environments. This designation makes the IHRC Florida's official hurricane research center for 11 universities comprising the state university system.

The citizens of the U.S. East and Gulf Coasts and Caribbean Islands are severely impacted by hurricanes, and IHRC promotes an interdisciplinary, large-scale disaster research agenda to address this vulnerability. Disciplines such as architecture, business, economics, engineering, finance, geosciences, insurance, political science, sociology, and urban planning are involved in a long-term, integrated research program that helps Florida, the nation, and its regional neighbors to mitigate hurricane exposure.

The Center developed as a result of a public-private partnership between the We Will Rebuild Foundation, an organization formed to spearhead the rebuilding of Dade County in 1992 after Hurricane Andrew, and FIU. The IHRC works in conjunction with the National Hurricane Center, which is also located at the FIU Modesto A. Maidique Campus in West Miami-Dade.

Lehman Center for Transportation Research (LCTR)

L. David Shen, P.E., T.E. Director and Professor, Civil and Environmental Engineering
Sylvan C. Jolibois, Jr., Deputy Director and Associate Professor, Civil and Environmental Engineering
Albert Gan, Deputy Director and Associate Professor, Civil and Environmental Engineering
Favian Cevallos, Transit Program Director

The Lehman Center for Transportation Research (LCTR) at Florida International University was established in 1993 in honor of Congressman Bill Lehman and his tireless efforts to make South Florida a better place for all of us. The center’s vision is to become a ‘state-of-the-art’ transportation research and training facility. LCTR is committed to serve and benefit our society by conducting research to improve mobility, hence the quality of life issues, develop partnerships in the transportation industry, and educate a multidisciplinary workforce to plan, design, manage and implement transportation systems.

Faculty, staff and students at LCTR are involved in research related to the planning, design, operation and maintenance of transportation systems, including intelligent transportation systems, public transportation, highway transportation, aviation, and freight; as well as public policy, air pollution, and the application of geographic information systems and other advanced technologies such as artificial neural networks and scientific visualization in transportation. Future plans include networking with the public and private industry to collaborate on transportation related research. In addition, applied research will be conducted on, but not limited to intelligent vehicle and highway systems.

Motorola Nanofabrication Research Facility

Chunlei (Peggy) Wang, Interim Director and Associate Professor, Mechanical and Materials Engineering
Neal Ricks, Lab Manager

The first centralized facility of its kind in Florida, the Motorola Nanofabrication Research Facility is an open-access initiative in support of nano-scale devices, systems and materials research that encompasses a broad range of technologies and capabilities. The facility provides nanofabrication, analytical instrumentation, materials characterization and process-development laboratories for students, faculty and industrial researchers. This $15
Harnessing the synergy inherent in the study and development of nanoscale technologies, the facility boasts:

- Specialized equipment required to develop new fabrication techniques unique to the creation of functional materials and devices that are no greater than 100 nanometers (1,000 times smaller than the diameter of a human hair);
- A full complement of standard semiconductor processing equipment to leverage the capabilities of robust and proven techniques; and
- State-of-the-art analytical tools to study, and characterize these nano-sized devices, as well as the materials and processes used to make them.

The Nanotechnology Faculty Team

- Chunlei (Peggy) Wang, Interim Director and Associate Professor, Mechanical and Materials Engineering
- Arvind Agarwal, Professor, Mechanical and Materials Engineering
- George Dulikravich, Professor, Mechanical and Materials Engineering
- W. Kinzy Jones, Professor, Mechanical and Materials Engineering
- Grover Larkins, Professor, Electrical and Computer Engineering
- Watson Lees, Associate Professor, Chemistry
- Chenzhong Li, Associate Professor, Biomedical Engineering
- Wenzhi Li, Associate Professor, Physics
- Anthony McGoron, Associate Professor, Biomedical Engineering
- Surendra Saxena, Professor, Mechanical and Materials Engineering
- Frank Urban, Associate Professor, Electrical and Computer Engineering
- Yuriy Vlasov, Research Engineer

Structures and Construction Laboratory

- Amir Mirmiran, Director and Dean
- Nakin Suksawang, Deputy Director
- Edgar Polo, Lab Manager

Structures and Construction Laboratory (SCL) is established to provide hands-on educational experience for students; to research and development of innovative hurricane-resistant and durable construction materials, structural systems and components; to serve the construction industry; to contribute to the engineering community in South Florida, and to advance the safety, durability, and economy of our civil infrastructure.

The Structures and Construction Laboratory was built through the help of a consortium of 21 industry partners who donated materials, services, and cash in excess of $250,000. It is one of the largest facilities in the State of Florida and is equipped with a full-scale structural testing system (FSST). The FSST consists of a 15 ft tall testing frame that stands above a 35 ft x 65 ft strong concrete floor with 4 ft thickness and 100,000 lbs capacity tie-downs on a 3 ft x 6 ft pattern. The steel frame is capable of testing full-scale structural members, such as a 65 ft bridge girder. The applied load is replicated using a fatigue rated tension/compression actuator that is capable of performing cyclic loading. In addition to the FSST, the SCL is also equipped with other material testing systems, including a universal testing machine, compression machine, and small-scale load frames.

Telecommunications and Information Technology Institute

- Niki Pissinou, Director and Professor, School of Computing and Information Sciences

Florida International University (FIU) recognizes the need to nurture highly trained personnel for the nation’s industry and business, develop research to support the rapidly expanding high-tech industry and become proactive in technology transfer. Thus, ensuring continued economic growth and prosperity. In order to fully meet today’s technological demands, FIU has established the Telecommunications and Information Technology Institute (IT²). IT² promotes advanced multi-disciplinary education and research focused on telecommunications and information technologies. IT²’s mission is to:

1) Deliver high quality telecommunications and information technology education and training.
2) Conduct and promote research to enhance Florida’s role as a leader in telecommunications and information technology.
3) Offer training that is needed to foster business development and workforce preparedness.
4) Promote technology transfer to enhance the enabling technologies of the telecommunication and information technology industries.

In fulfilling its mission, IT² promotes multidisciplinary collaboration and serves as the catalyst to promote intellectual cross-fertilization among disciplines. This effort results in the synergistic enhancement of teaching and research, so critical in the telecommunications and information technology fields, where disciplinary barriers are falling and lines are blurred. An objective of the Institute is to infuse telecommunications and information technology content into the curriculum at all appropriate levels. To fill the urgent demand of industry, the institute is developing interdisciplinary telecommunication programs that provide certificate programs, Bachelors, Masters and Ph.D. degrees.

IT² constitutes an infrastructure that is viable for cutting edge research activities. Researchers at the institute conduct funded research and development targeted at solving complex problems conducive to the early identification of high impact opportunities. Of particular importance to the institute’s research efforts is the emerging global wireless, optical and personal communications infrastructure and the ability to represent, store and access information to perform a variety of information related tasks. To provide an effective forum for original research results and to foster communication among researchers industry leaders can collaborate on education, training, and re-engineering the telecommunications workforce of the future. The alliance provides effective ways to educate the workforce of the 21st century. In accordance, the institute provides technical assistance and applied research services to transfer acquired knowledge and technologies to the commercial sector. The IT² team can work with industrial
organizations to tap into some technological innovation that drive the industry to its strategic advantage.

For more information, contact Dr. Niki Pissinou, the director of the Telecommunications and Information Technology Institute, at (305) 348-3987 or visit our website at www.it2.fiu.edu.

Core Faculty
Niki Pissinou, Director/Professor
Deng Pan, Associate Professor

Affiliated Faculty and Research Faculty
Kang Yen, Professor, Electrical and Computer Engineering
Jean Andrian, Associate Professor, Electrical and Computer Engineering
Shih-Ming Lee, Associate Professor, Engineering Management
Osama Mohammed, Professor, Electrical and Computer Engineering