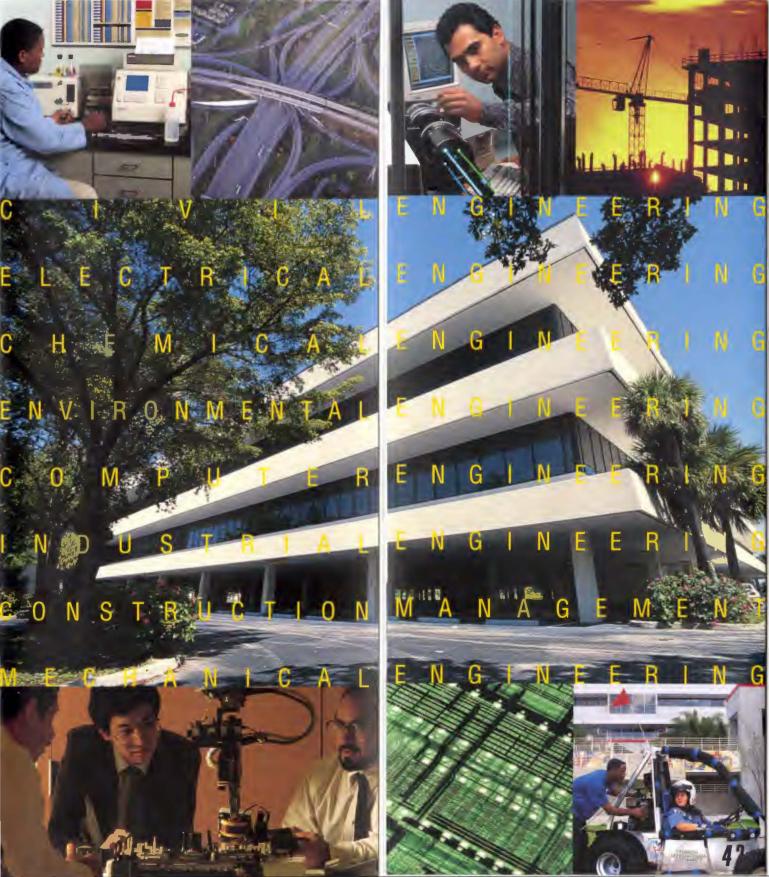
# College of **Engineering**

conce





**en-gi-neer-ing** n (1720) **1:** the application of science and mathematics by which properties of matter and sources of energy in nature are made useful to people in structures, machines, products, systems, and processes **2:** the best career choice

Florida International University is one of America's most dynamic and fastest growing universities. Since opening its doors in 1972, FIU has achieved many milestones of growth and excellence that have taken other universities as long as a century to reach.

FIU is recognized as one of the nation's finest comprehensive universities by *U.S. News & World Report's* annual survey of "America's Best Colleges," and as one of the top public commuter universities in the nation by *Money* magazine.

The College of Engineering is South Florida's premier engineering education resource. Located in a vibrant, international metropolitan community, FIU offers students the opportunity to evolve in a culturally diverse environment and participate in South Florida's international business activities while in school. Students in the College of Engineering benefit from this and are better prepared to enter the global market upon graduation.

Research is an integral part of the College's success. The College provides outstanding research opportunities for graduate students and embeds significant research experience in its undergraduate curriculum. Research is supported by centers of excellence, where faculty and students work with cutting edge technology, and is funded by all major federal agencies and a large number of local, national and international corporations.

Areas of research include:

biomedical

information systems

computer technology

· manufacturing

environmental

microelectronics

image processing

transportation

RESEARCH CENTERS

Cardiovascular Engineering Center (CVEC)

- Center for Advanced Technology and Education (CATE)
- Future Aerospace Science and Technology Center for Cyroelectronics (FAST)
- Hemispheric Center for Environmental Technology (HCET)
- Lehman Center for Transportation Research (LCTR)
- Manufacturing Research Center (MRC)
- Southern Technology Application Center (STAC)
- Water Research Center (WRC)

The College's distinguished faculty is recognized by the University for excellence in teaching, research and service, and has received numerous national awards for innovative developments. Faculty provide consulting services to national and international organizations and serve as officers in leading professional societies.

The College resides in the Center for Engineering and Applied Sciences, a 250,000-foot building on 36 acres situated less than two miles from the University Park Campus. This facility houses world-class research centers, teaching laboratories, faculty offices, study areas, computing facilities, and research laboratories.

All baccalaureate engineering programs are fully accredited by the Accreditation Board for Engineering and Technology (ABET) and the Construction Management program is accredited by the American Council for Construction Education.

#### DEGREES

- · Biomedical Engineering MS
- · Civil Engineering BS, MS, PhD
- · Chemical Engineering BS
- · Computer Engineering BS, MS
- · Construction Management BS, MS
- Electrical Engineering BS, MS, PhD
- Engineering Management MS
- Environmental Engineering MS
- Environmental & Urban Systems MS
- Industrial & Systems Engineering BS, MS
- · Mechanical Engineering BS, MS, PhD

#### PROPOSED DEGREES

- · Chemical Engineering MS
- · Construction Engineering BS
- Environmental Engineering BS
- Industrial & Systems Engineering PhD
- Material Science and Engineering MS
   Software Systems Engineering BS

#### **Student Support Centers**

The Engineering Information Center (EIC) is responsible for the design, implementation and management of the College's information systems infrastructure, student computational labs, the Multimedia Development and the Advanced Applications Training Laboratories.

The **Engineering Advising Center** assists undergraduate students by providing curriculum and career advising, registration, academic progress and retention services. Faculty advisors from each discipline, along with support personnel, staff the center.

The Office of Diversity and International Programs is responsible for engineering education outreach efforts geared at increasing the participation of groups traditionally underrepresented in the engineering profession. The Office sponsors a number of programs in local high schools, as well as several programs within the College.

#### **Industry Involvement**

The Advisory Council for Engineering (ACE) represents the interest of industry and the engineering community in the process of facilitating the highest level of engineering education, research and

service at FIU. ACE provides counsel, advice and support on various matters that are of strategic importance to the development of the engineering programs, the College and the University.

Some of the companies represented in ACE are:

- · Beckman Coulter Inc.
- Lucent Technologies
- Camp Dresser & McKee, Inc.
- Motorola
- · Cordis Corp./Johnson & Johnson · Nortel CALA
- IBM
- Partisan Management Group
- · Florida Power & Light
- Unipower Corporation
- Kimely-Horn and Associates

#### **Other Programs**

The **Engineering Forum** is co-sponsored by the University's Office of Career Services every October. The Forum brings to campus engineering professionals who share experiences with students for an evening of presentations followed by a reception. All students are encouraged to attend.

The FIU Technical Career Fair is sponsored by the University's Office of Career Services every September and January. Students have the opportunity to meet with recruiters and gain knowledge about companies employing engineers.

Engineering Leadership Program (ELP) is designed to expose students to community and industry leaders in an effort to encourage engineers to become active in their communities and evolve as leaders. ELP also provide community and corporate leaders the opportunity to meet the student leadership in the College of Engineering.

#### HONOR SOCIETIES

- Alpha Pi Mu Industrial & Systems Engineering
- · Chi Epsilon Civil Engineering
- Eta Kappa Nu Electrical & Computer Engineering
- Pi Tau Sigma Mechanical Engineering
- · Sigma Lambda Chi National Society for Construction
- Tau Beta Pi National Engineering Honor Society

#### STUDENT ORGANIZATIONS

- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Associated General Contractors of America
- Associated Builders and Contractors
- · Association of Cuban-American Engineers
- Florida Engineering Society
- INFORMS
- Institute of Industrial Engineers
- Institute of Electrical and Electronic Engineers
- Mexican American Engineering Society
- National Association of Women in Construction
- National Society of Black Engineers
- Society of Hispanic Professional Engineers
- Society of Women Engineers
- Water Environment Federation



**Electrical & Computer Engineering** 



**Electrical Engineering** is the branch of engineering responsible for many exciting, modern-day technologies such as lasers, satellites, computers, and robotics. Electrical engineers are primarily concerned with the generation, transmission and utilization of electric energy and intelligence. They play a key role in today's information age, and ensure advances for the future. The study of electrical engineering encompasses three major areas: ELECTRONICS, SYSTEMS and COMPUTERS.

In **Electronics** engineers deal with all aspects of solid-state electronic devices, the analysis and design of analog and digital electronic circuits for a wide range of applications in signal processing and measurement equipment, communication systems, control systems.

The electrical engineers specializing in the **Systems** area concentrate on a large variety of systems concerned with signals and systems, and deal with the analysis and design of control communication electromagnetic and digital systems.

The area of **Computers** has become a major part of electrical engineering, so much so that a separate degree is offered in COMPUTER ENGINEERING. Engineers in this field are concerned with the design, development and implementation of computer systems devices.

#### **Degree Programs:**

- · Bachelor of Science in Electrical Engineering
- · Bachelor of Science in Computer Engineering
- · Master of Science in Electrical Engineering
- · Master of Science in Computer Engineering
- · Doctor of Philosophy in Electrical Engineering

Research AREAS: computer-managed multimedia systems; computer vision; image processing, electromagnetic compatibility techniques, nuclear detectors and sensors; power system operations and control, artificial intelligence application to power systems, quantum noise in solid-state devices.

and biomedical signal processing; neural networks; wavelet integrated systems, and development of laser diode optical sources; and computer networking.

#### Laboratories

- · Asynchronous Learning Networks
- · Data Communications
- · Digital Signal Processing
- · Electrical Noise Research
- · Electro-magnetic and Energy Research
- · Thin Film Laboratory
- Microwave / Radio Frequency
- · Power Systems, Power Electronics & Energy Conversion
- Scanning Tunneling Microscopy
- · Solid State Devices
- System Dynamics

For more information contact:

### Department of Electrical & Computer Engineering FLORIDA INTERNATIONAL UNIVERSITY Center for Engineering & Applied Sciences

University Park Miami, Florida 33199

t: 305-348-2521

f: 305-348-3582

e: info@eng.fiu.edu

www.eng.fiu.edu

#### Office of Admissions

305-348-2363

www.fiu.edu/orgs/admiss

#### Financial Aid

305-348-2489

www.fiu.edu/orgs/finaid



### Industrial & Systems Engineering

CREATIVE

realization

solution 5

### vision

NNOVATION

### concept



Industrial and Systems Engineering is concerned with integrated systems of people, and the design, improvement and installation of materials, and equipment. Drawing upon specialized skills in the math, physics, and social sciences; together with principles and methods of engineering analysis), industrial engineers specify, predict, and evaluate the results to be obtained from such systems. Some integrated working systems arise in industry and manufacturing, while others are found in a variety of non-industrial settings ranging from healthcare and education to financial centers and government. The wide range of tasks an industrial engineer may be called upon to perform in different settings necessitates knowledge of operations research, ergonomics, management statistics, manufacturing engineering, and computer information processing.

A major difference between Industrial Engineering and the other engineering disciplines is that it must not only consider the behavior of inanimate objects as they are governed by physical laws, but also the behavior of people as they operate together in organizations. Industrial Engineering is often called the people oriented engineering discipline.

#### Degrees:

- Bachelor of Science in Industrial & Systems Engineering
- · Master of Science in Industrial Engineering
- Master of Science in Industrial Engineering Manufacturing Engineering track

#### **Research Areas:**

The faculty actively engage in research activities in the areas of material handling, safety engineering, occupational biomechanics, queuing modeling, CAD/CAM systems integration, concurrent engineering, applied Al/expert systems, manufacturing systems design, manufacturing automation, production planning and control, machine control and robotics, computer simulation, mathematical programming, engineering economic modeling, human/computer interaction, reverse engineering, and quality engineering.

#### Laboratories:

- · Computer Integrated Manufacturing
- Concurrent Engineering
- Human Computer Interaction
- · Human Factors/Ergonomics
- Industrial Fabrication
- Industrial Materials
- Systems Simulation

For more information contact:

Department of Industrial & Systems Engineering FLORIDA INTERNATIONAL UNIVERSITY Center for Engineering & Applied Sciences University Park Miami, Florida 33199

t: 305-348-2521 f: 305-348-3582 e: info@eng.fiu.edu www.eng.fiu.edu

Office of Admissions 305-348-2363 www.fiu.edu/orgs/admiss



Civil and Environmental Engineers face the challenge of building a better quality of life for society. They are responsible for the planning, design, construction, operation, and management of buildings, bridges, dams, canals, highways, mass transit systems, airports, seaports, railroads, as well as water and wastewater treatment facilities, and systems to achieve and maintain air quality. As the population grows and becomes more technologically advanced, civil and environmental engineers will be heavily involved in environmental and public health issues. The disposal of newly generated wastes and handling of contaminated sites will be closely examined. The development of new technological methods will allow environmental engineers to control water and air quality and to predict the movement and dispersion of wastes in ground and surface waters. As new materials are produced and computer technology enhanced, civil engineers will design and build innovative facilities, ranging from tall buildings to space stations. In all of these areas, civil and environmental engineers possess the rare opportunity to impact societal problems and improve the environment...

#### Degrees:

- · Bachelor of Science in Civil Engineering
- · Master of Science in Civil Engineering
- · Master of Science in Environmental Engineering
- · Master of Science in Environmental & Urban Systems
- · Doctor of Philosophy in Civil Engineering

#### **Research Areas:**

Vibration and impact analysis of steel and concrete bridges; comparison of steel column design; international housing planning and construction; application of genetic algorithms to truss configuration design; analysis of intermodal guideway transit systems; water, air and soil quality; hazardous and radioactive material management; and treatment technologies applied to pollution control, prevention, cleanup, remediation, and restoration.

#### Laboratories:

- · Air Pollution
- Environmental
- · Fluids
- Geotechnical
- · GIS
- Materials
- · Senior Design
- · Transportation Research
- Wastewater
- · Water Supply

For more information contact:

Department of Civil & Environmental Engineering FLORIDA INTERNATIONAL UNIVERSITY Center for Engineering & Applied Sciences University Park Miami, Florida 33199

t: 305-348-2521

f: 305-348-3582

e: info@eng.fiu.edu

www.eng.fiu.edu

Office of Admissions 305-348-2363

www.fiu.edu/orgs/admiss

**Financial Aid** 

305-348-2489

www.fiu.edu/orgs/finaid

**Civil & Environmental Engineering** 

concept



Civil and Environmental Engineers face the challenge of building a better quality of life for society. They are responsible for the planning, design, construction, operation, and management of buildings, bridges, dams, canals, highways. mass transit systems, airports, seaports, railroads, as well as water and wastewater treatment facilities, and systems to achieve and maintain air quality. As the population grows and becomes more technologically advanced, civil and environmental engineers will be heavily involved in environmental and public health issues. The disposal of newly generated wastes and handling of contaminated sites will be closely examined. The development of new technological methods will allow environmental engineers to control water and air quality and to predict the movement and dispersion of wastes in ground and surface waters. As new materials are produced and computer technology enhanced, civil engineers will design and build innovative facilities, ranging from tall buildings to space stations. In all of these areas, civil and environmental engineers possess the rare opportunity to impact societal problems and improve the environment...

#### Degrees:

- · Bachelor of Science in Civil Engineering
- · Master of Science in Civil Engineering
- · Master of Science in Environmental Engineering
- · Master of Science in Environmental & Urban Systems
- . Doctor of Philosophy in Civil Engineering

#### **Research Areas:**

Vibration and impact analysis of steel and concrete bridges; comparison of steel column design; international housing planning and construction; application of genetic algorithms to truss configuration design; analysis of intermodal guideway transit systems; water, air and soil quality; hazardous and radioactive material management; and treatment technologies applied to pollution control, prevention, cleanup, remediation, and restoration.

#### Laboratories:

- · Air Pollution
- Environmental
- · Fluids
- Geotechnical
- · GIS
- Materials
- · Senior Design
- · Transportation Research
- Wastewater
- · Water Supply

For more information contact:

Department of Civil & Environmental Engineering FLORIDA INTERNATIONAL UNIVERSITY Center for Engineering & Applied Sciences University Park Miami, Florida 33199

t: 305-348-2521

f: 305-348-3582

e: info@eng.fiu.edu

www.eng.fiu.edu

Office of Admissions

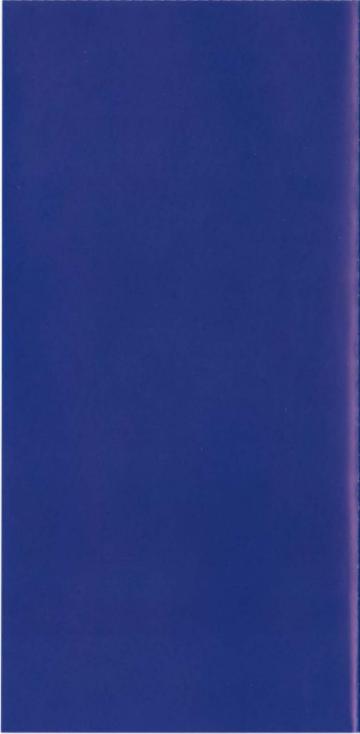
305-348-2363

www.fiu.edu/orgs/admiss

**Financial Aid** 

305-348-2489

www.fiu.edu/orgs/finaid



### Construction Management

CREATIVE realization

## vision

INNOVATION

## concept

technology



As we approach the 21st century dramatic changes are occurring in the construction industry. Chief among these is the nature and the complexity of today's construction projects. Once there was a time when single craftspeople with small crews had all the knowledge, training, tools and equipment required to undertake complete projects. Present day construction projects, however, are comprised of complex systems and sub-systems requiring specialized knowledge for proper installation and operation. As a result, the era of one firm having the personnel, equipment, and the requisite and resident knowledge and capabilities to construct major projects is rapidly coming to a close.

In essence, the effect of these changes has more to do with construction organizations and operations than with materials and applications. Individuals in charge of getting construction projects built (constructors) are faced with more problems making decisions related to management, operations analysis, organizational and other non technical issues, than with structural, materials and other traditional construction issues. Problems dealing with materials and processes still arise. They are minor in nature and in significance, however, when compared to the importance and severity of those dealing with the effective and timely marshalling of the many and varied resources that need to be brought together to complete a project within time and budgetary constraints.

From an educational perspective, professional construction education for the next millenium requires that the constructor be provided with the proper foundation for decision making in a broad spectrum of disciplines, including economics, law, accounting, management, marketing, real estate. It also implies a level of understanding of the traditional structures, materials, and processes which is greater than that of the layman, but less than that of an engineer.

The **Construction Management** program at FIU is designed to provide that education.

Construction managers are employed as construction superintendents, project managers, project schedulers, or cost estimators. Some are found managing their own construction businesses.

Construction managers have excellent opportunities for employment or advancement in all areas of the construction

industry. These include land development, home building, public building, industrialized building systems, commercial, industrial, marine and heavy construction, underwater and space age facilities, material and equipment sales and installations, and construction product research, development and sales.

#### Degrees:

- · Bachelor of Science in Construction Management
- · Master of Science in Construction Management

#### **Research Areas:**

- Alternative Bid Evaluation and Contract Award Systems
- Application of Fuzzy Logic to Construction Decision Making
- Assessment of the Effectiveness of HVAC Sanitation Processes
- · Construction of Hurricane Resistant Structures
- · Construction Licensing Systems
- · Development and Enforcement of Building Codes
- Worker's Compensation Issues in Construction

For more information contact:

Department of Construction Management FLORIDA INTERNATIONAL UNIVERSITY Center for Engineering & Applied Sciences University Park Miami, Florida 33199

t: 305-348-2521 f: 305-348-3582 e: info@eng.fiu.edu www.eng.fiu.edu

Office of Admissions 305-348-2363 www.fiu.edu/orgs/admiss



Mechanical & Chemical Engineering

CREATIVE

realization

solutions

vision

NNOVATION

concept



In general terms, Mechanical Engineering deals with the design, development, and operation of systems and processes that involve physical movement. It encompasses all types of machines and machinery to include those used for manufacture, transportation and construction. Mechanical engineers are principal contributors to the automotive, aircraft and spacecraft fields as designers as well as in development and manufacture. They play a leading role in the development and implementation of robots as well as in all types of rotating and reciprocating machinery. Pumps, compressors, turbines, nozzles, diffusers, valves, condensers, evaporators and other types of heat exchange equipment are devices that are designed, developed and implemented by mechanical engineers. Increasingly mechanical engineers are involved in the design of mechanical and fluid systems for implementation as biomedical devices.

Chemical Engineering involves the design, development and operation of systems and processes that involve chemistry or chemical processes. Chemical engineers are principal contributors to the design development and manufacture of systems and products that involve chemical processes. These include agrochemicals, petrochemicals, pharmaceuticals, synthetic fibers and films. Chemical engineers play a leading role in the design of chemical reactors, dryers, scrubbers, distillation columns, filters and other separators. Increasingly, chemical engineers are involved in chemical and biological process applications in environmental and bioengineering applications.

#### Degrees:

- · Bachelor of Science in Mechanical Engineering
- · Bachelor of Science in Chemical Engineering
- Master of Science in Mechanical Engineering
- Doctor of Philosophy in Mechanical Engineering

#### Research Areas:

- Biomedical
- CAD/CAM/Robotics
- Environmental Waste Management
- Manufacturing
- Materials
- Thermal/Fluid Science & Combustion

Studies in the areas of Materials Science and Solid Mechanics include courses in:

- Biofluid Mechanics
- · Electronic Packaging
- · Finite Element Analysis
- Microelectronics

#### Laboratories:

- Applied Mechanics
- Lubrication
- Biofluid Mechanics Biomechanics
- · Materials Analysis/Science Robotics & Automation
- Combustion
- Robotics/CAD
- Hazardous Waste Mgt.
   Solidification Heat Transfer
  - Thermal Science
- · Hybrid Microelectronics · Vibrations & Materials

For more information contact:

#### Department of Mechanical & Chemical Engineering FLORIDA INTERNATIONAL UNIVERSITY

Center for Engineering & Applied Sciences University Park, Miami, Florida 33199

t: 305-348-2521

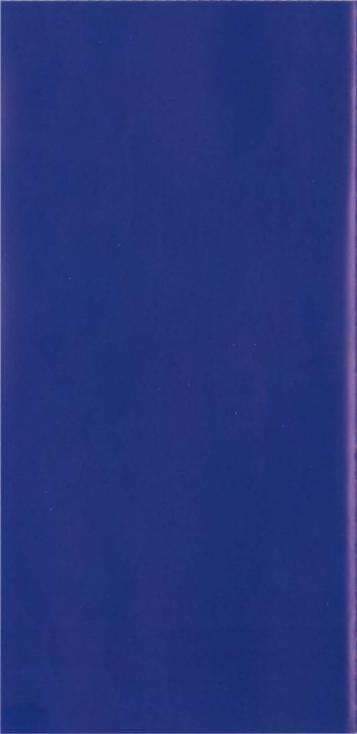
f: 305-348-3582

e: info@eng.fiu.edu www.eng.fiu.edu

#### Office of Admissions

305-348-2363

www.fiu.edu/orgs/admiss



# College of Engineering ADMISSIONS REATIVE

realization

vision

V I S I O II

ATION

# concept

hnology



Our world relies on science and technology for prosperity and survival. Science is the discovery of nature. Engineering is the technical application of science for the benefit of human kind. Engineers solve real-life problems. They find the best solutions through the application of their combined knowledge, experience, and judgement. Engineering is the career of the future.

The College of Engineering at FIU offers students a world of opportunities with its modern facilities, location, educational philosophy and outstanding faculty. Its programs include a strong engineering foundation designed to prepare the prospective engineer with a broad base of fundamental courses in mathematics, sciences and technical knowledge. Coupled with a number of interdisciplinary activities, the engineering curriculum exposes students to an understanding of the social and ethical responsibilities of engineers. Such activities, ranging from industry projects to professional competitions, challenge the student to apply scientific knowledge to real world problems.

In addition to engineering, the College offers students exciting opportunities with programs in Construction Management, and Environmental and Urban Systems. These programs provide students the benefit of an association with technology by sharing learning facilities, laboratories, computer resources and research activity.

In today's high-tech world, engineering degrees offer the best foundation for a wide variety of careers. Engineering graduates find success in traditional engineering jobs as well as in management, sales, government, medicine, research, law, teaching, and more. Some choose to earn advanced degrees after they graduate from FIU, and some even start their own companies. More than 200 companies recruit FIU engineering students for internships and permanent positions.

#### **ADMISSIONS**

#### **Undergraduate**

- All general admission requirements of the University must be satisfied.
- In order to enter upper division engineering programs, FIU undergraduates must have met all the lower division requirements including the CLAST, the completion of a

- minimum of 60 semester hours, and have satisfied all the basic courses (Math, Natural Sciences, English, and Humanities/Social Sciences).
- Students 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 with an overall GPA of 2.5 in theses courses.

#### Transfer

There is a two-step process in the evaluation of transfer credits.

- The Office of Admissions will make a preliminary evaluation of the student background for general compliance and determination of applicable General Education courses taken. All transfer students must meet the general University requirement for admission and must pass the CLAST.
- A final evaluation is performed by the Department for exact transfer of applicable credit.

#### **Master of Science**

- Students seeking admission into graduate programs must have a BS degree in engineering, physical sciences, computer science or mathematics from an accredited institution. Students with degrees from disciplines other than engineering will be required to take additional courses as needed in mathematics, natural sciences and basic engineering. Students seeking admissions in the construction management program should hold a BS degree in construction, construction management, architecture, engineering, business or equivalent field.
- A 3.0 average or higher during the last two years of undergraduate work, and/or a GRE score of 1000 or better. All applicants must submit GRE scores. The Construction Management program also accepts a GMAT score of 500 or better.
- 3. All programs offer thesis and non-thesis options.
- 4. TOEFL score of at least 550 if English is a second language.

#### **Doctor of Philosophy**

Applicants having a MS degree in engineering from an accredited institution must satisfy the following requirements:

- 1. A GPA of 3.3/4.0 or higher in the MS program.
- 2. A GRE score of at least 1000.
- 3. Three letters of recommendations in the forms provided by the department.
- 4. TOEFL score of at least 550 if English is a second language.

**Scholarships** 

FIU and the College of Engineering offer numerous scholarships and fellowships to qualified students. Academic scholarships for entering students, freshman and transfer, are available through the University Admissions Office. The College also offers a number of scholarships to entering students based on academic merit and/or financial need. Industry sponsored scholarships are also available through the College for full-time junior and senior students. Summer internships frequently accompany the monetary award given by industry, and often these industry awards are renewable.

**External Programs** 

The Florida Engineering Education Delivery System (FEEDS) enables FIU to offer undergraduate and graduate level courses off-site. These courses are often delivered to industry or cooperative sites via videotapes, one-way video/two-way audio or two-way video conferencing. Students can select a number of courses to accommodate work or family responsibilities. Full programs are offered through FEEDS for MS degrees in Electrical and Computer Engineering, Industrial Engineering, Construction Management, and Engineering Management.

For more information contact:

College of Engineering
FLORIDA INTERNATIONAL UNIVERSITY
Center for Engineering & Applied Sciences
University Park
Miami, Florida 33199

t: 305-348-2521 f: 305-348-3582 e: info@eng.fiu.edu www.eng.fiu.edu

Office of Admissions 305-348-2363 www.fiu.edu/orgs/admiss



For more information, contact:

### College of Engineering From the Instrument Control of C

Center for Engineering and Applied Sciences University Park, EAS 2460 Miami, Florida 33199

- 1 305-348-2973
- 1 305-348-1401
- e: info@eng.fiu.edu

www.eng.fiu.edu