

Fall 2001

## BME STATS Fall 2001

Department of Biomedical Engineering, Florida International University

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## Funding Opportunities for Biomedical Engineering Students

The Whitaker Foundation, a private, nonprofit foundation dedicated to improving human health through the support of biomedical engineering, offers a variety of graduate fellowships. Visit their website at <http://www.whitaker.org/grants/fellanc.html> for information and current deadlines. Or contact them at:

**The Whitaker Foundation**  
1700 North Moore Street, Suite 2200  
Rosslyn, VA 22209  
(703) 528-2430 - [info@whitaker.org](mailto:info@whitaker.org)

Research program funding is available from the American Heart Association. Go to <http://www.americanheart.org> for more

information on the upcoming deadlines for application, or write to:

**American Heart Association**  
National Center  
7272 Greenville Avenue  
Dallas, TX 75231

Information on funding from the National Science Foundation can be found at <http://www.nsf.gov/home/grants.htm> or write to:

**National Science Foundation**  
4201 Wilson Boulevard  
Arlington, VA 22230  
(703) 292-5111

## Biomedical Engineering Courses

Fall 2001

Course	Title	Credits	Instructor	Days & Times
ELR 4202C	Medical Instrumentation Design	4	Heimer	M, W 1610-1725
EGM 4580	Principles of Bioengineering	3	McGoron	M, W 1905-2020
EML 4585	Design Bio Systems Devices	3	Schoephoerster	T, R 1310-1425
BME 4990	Clinical Rotations for Biomedical Engineering	1	McGoron	F 1300-1550
BME 4991	BME Design Project Organization	1	Schoephoerster/Amit	R 840-955
BME 5xxx*	Applied Biomedical Engineering Principles	3	McGoron	M, W 1905-2020
BME 5990C	Physical Foundations of Medical Imaging Instruments	3	Franquiz	M, W 840-955
BME 5991	Nonlinear Systems Applications in Life Sciences	3	Yaylali	T, R 1905-2020
EEL 6075	Biosignal Processing 1	3	Barreto	T, R 1610-1725
BME 6936	Biomedical Engineering Seminar	1	Moore	TBA
BME 6990	Independent Studies	1	Schoephoerster	TBA

\*Course number TBA

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### Clinical and Industry Program

of Medtronic/World Medical. Dr. Barry T. Katzen, Medical Director of the Miami Cardiac & Vascular Institute, said, "We are excited about the possibilities of partnering with the BMEI's biomedical engineering program and feel it will enhance Baptist Hospital System's commitment to serving our community." At the meeting the partners looked into the integration of industry and hospitals with the education of the new generation of biomedical engineers at FIU. "While university research can provide new ideas and knowledge, industry partners are needed to commercially develop findings, and hospitals facilitate clinical applications of new technologies," said Richard Schoephoerster.

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### Coulter Foundation Grant

"The impact the Wallace H. Coulter Foundation grant will have cannot be overstated. It provides the framework for a major biomedical engineering program in South Florida and supports one of our most important industries," said FIU President Modesto Maidique.

The Coulter grant will also help the BMEI add a Ph.D. program in biomedical engineering and fund an expansion of BMEI's partnership with Baptist Health Systems. "It really guarantees permanence for the program when we're just getting off the blocks," said Richard Schoephoerster, Director of the BMEI. "It's a strong foundation to build upon."

## Schedule of Selected Events

### ACADEMIC CALENDAR

- August 6-10** - Registration information and access codes available for Fall 2001 term
- August 13 - 17** - Official registration week (degree-seeking students) only by appointment time and day
- August 20 - 25** - Open registration all students. Phone and web & kiosk registration continuous
- August 25** - Last day (by 1 p.m.) to pay tuition and fees to avoid cancellation of enrollment  
- Last day to register (by 1 p.m.) without incurring a \$100.00 late registration fee
- August 27** - Classes begin
- September 1** - Last day (by 1 p.m.) to complete late registration. Drop/add period ends at 1 p.m.  
- Last day to change a grading option.  
- Last day (by 1 p.m.) to drop courses or withdraw from the University without incurring a financial liability
- September 3** - Labor Day holiday (University closed)
- September 14** - Last day (by 5 pm) to apply for graduation at the end of Fall 2001 term  
- Last day to submit Form C: Thesis/Dissertation Committee Appointments (Graduate students)
- September 17** - Undergraduate studies advising for Spring 2002 term begins
- October 8** - Fall 2001 Mini-Term.
- October 20** - Deadline (by 1 p.m.) to drop a course with a DR grade. Deadline (by 1 p.m.) to withdraw from the University with a WI grade
- November 11** - Veterans' Day holiday (University closed)
- November 12** - Veterans' Day holiday observed (University closed)
- November 13** - Last day to submit Form D: Request for Thesis/Dissertation Defense (Graduate students)
- November 22 - 23** - Thanksgiving holiday (University closed)
- November 27** - Last day to hold thesis/dissertation defense (Graduate students)
- December 7** - Classes end
- December 8 - 14** - Official examination period
- December 14** - Last day to submit final copy and Form F: Thesis/Dissertation Memorandum of Approval (Graduate students)
- December 17 & 18** - Commencement exercises
- December 20** - Grades available to students by telephone, web and at kiosks
- December 25** - Christmas holiday (University closed)



**FIU BIOMEDICAL ENGINEERING INSTITUTE**  
FLORIDA INTERNATIONAL UNIVERSITY  
Integrating Academia, Clinical Medicine and the Biomedical Industry



Fall 2001 Volume 1 • Number 1

BIOMEDICAL ENGINEERING INSTITUTE NEWSLETTER

[HTTP://WWW.ENG.FIU.EDU/BMEI](http://www.eng.fiu.edu/bmei)

### Message from the Director

These are very exciting times to be in the field of biomedical engineering. The field is exploding and gaining increased stature at every turn. Allow me to provide some evidence at both the national and local scenes. The conclusion of The Human Genome Project, the development of micro- and nano- technology, and the maturation of computational and telecommunication modalities will enable biomedical engineers to provide maximum impact to the delivery of medicine. Indeed, the National Institutes of Health has recognized the significance of biomedical engineering for the future of healthcare by establishing the National Institute of Biomedical Imaging and Bioengineering. To have this major impact, more biomedical engineers will have to be produced now than ever before. Thanks in no small part to The Whitaker Foundation, there are now over 100 universities in the US with biomedical engineering programs. And FIU is among them.

Our program at FIU got off to quite an auspicious start with a \$1 million grant from The Whitaker Foundation. As we enter our second full year of implementation, the BME programs will have over 60 students enrolled, making it one of the fastest-growing programs at FIU. In recognition of the outstanding research performed in the BMEI, the BMEI has received a \$10 million grant from the Wallace H. Coulter Foundation.

All of this adds up to a tremendous opportunity for FIU students, and members of the local biomedical industry and clinical research establishments, to jump on the bandwagon towards a future of continued improvements in healthcare delivery.

Dr. Richard T. Schoephoerster, Director  
BMEI



## BMEI Initiates Innovative Program with Clinical and Industry Leaders



Participants: Standing left to right - Michael Christie (Cordis J&J), Eric Crumpler (BMEI), Rosie Verona (BMEI), Tony McGoron (BMEI), Diana Rincon (BMEI), William Abraham (Mount Sinai), Susanna Otano-Lata (Boston Scientific), Hamid Shahrestani (Boston Scientific), Mario Martinez (TechGeorgia-Nexus), Jim Byrne (BMEI), Kevin Smith (Syntheon), Ofer Amit (BMEI). Seated, left: James Moore (BMEI), Ron Sierra (Scion), Howard Leonhardt (Bioheart), Richard Schoephoerster (BMEI), Dana Jacobs (Beckman-Coulter), Mat Palmer (Medcanica). Not pictured: Simon Fuger (Medtronic/World Medical), Denise Jacques (Miami Children's Hospital), Prasanna Jayakar (Miami Children's Hospital), Jack Ziffler (Baptist/MCVI).

A new partnership program between the BMEI and leading South Florida hospitals and prominent biomedical firms was launched on June 14th, 2001. The program aims to enhance the training, research and development, and healthcare offered by the partners and the BMEI. The BMEI Partnership Program will foster excellence in biomedical engineering education and training; support innovation, invention and

discovery in medical technology; cultivate biomedical engineering research and development; and promote biomedical engineering entrepreneurship in South Florida. "The BMEI Partnership Program is unique in gathering leaders from various fields of biotechnology and giving us a role in guiding the development of biomedical engineering education," said Simon Fuger, CEO and Site Manager

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## BMEI Receives \$10 Million Landmark Grant from Wallace H. Coulter Foundation

THE COLLEGE OF ENGINEERING is the recipient of the largest grant ever received from a private foundation in FIU history. The grant is in support of the Biomedical Engineering Institute. The Wallace H. Coulter Foundation's \$5 million grant will be matched by the State University System of Florida's Trust Fund for Major Gifts to create the \$10 million endowment for the BMEI. The endowment will support an Eminent Scholars Chair in Biomedical Engineering, a Distinguished Professorship in Bioinstrumentation and Biomeasurement research, student fellowships and scholarships, a lecture series, and programs in support of research.

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### Biomedical Engineering STATS

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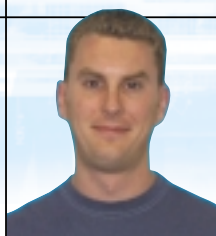
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Message from the President



The Biomedical Engineering Society is a well-known and established national society that unifies biomedical engineers, organizes conferences, furthers education, maintains professional standards, and publishes a newsletter and professional technical/research journal.

The **BMES** supports student chapters at universities offering a degree in biomedical engineering. I started the paperwork to establish a student chapter here at FIU in the fall of 2000. We elected officers in the first meeting so that we could quickly establish the student chapter. Currently the national **BMES** has recognized our organization as being an official student chapter and we are awaiting final approval from the Student Organization Council at FIU. Their approval will grant us a small sum of start-up money.

During Spring 2001 the **BMES** held two meetings with guest faculty speakers and a fundraising BBQ and raffle for a DVD player. These events were a success. We will soon hold another general meeting and a final executive meeting. Dates to be announced.

For the Fall 2001 semester, I plan to have shirts made for our next fundraiser, active recruiting for new members, community service, guest speakers, and set up a mentor program. We will hold elections for new officers as well.

In general, the **BMES** at FIU is here to organize the students, promote awareness of the profession, supplement education, provide peer interaction, leadership development, and resume enhancement.

*Thomas E. Claiborne, III*  
 Thomas E. Claiborne, III,  
 Founder BMES at FIU  
 Undergraduate Mechanical/Biomedical  
 Engineering Senior

Dr. James E. Moore, Jr., New Director of Cardiovascular Engineering Center

THE BIOMEDICAL ENGINEERING INSTITUTE is pleased to announce that the *Cardiovascular Engineering Center (CVEC)* is under new leadership. Dr. James Moore has accepted the position of Director of CVEC. CVEC is a research center of the Biomedical Engineering Institute, and supports traditional and applied research to advance cardiovascular engineering science and technology. CVEC works with industry and clinical professionals in an effort to accelerate the transfer of basic and applied research to practical applications. Students in CVEC have the opportunity to benefit from participation in research projects with faculty and industry and clinical professionals.

"I'm looking forward to advancing the research performed at CVEC, and I'm committed to maintaining the Center as a

vital link between academia and industry," said Dr. Moore.

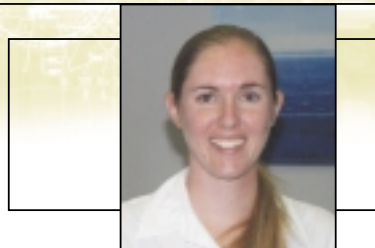
Dr. Moore is an Associate Professor. His research is focused primarily on the mechanics of the cardiovascular system. Some of Dr. Moore's current projects include quantifying the effects of combined shear stress and cyclic hoop stretch on the cells that make up the artery wall; flow in the coronary arteries; and the mechanical environment in stented arteries.



Dr. James Moore, Jr.

STUDENT SPOTLIGHT

>> Siobhain Gallocher



"I'm originally from a suburb outside Durban, South Africa. After high school in South Africa, I came to Miami, since I have family here and had been here before. I then got a degree at Broward Community College before enrolling at FIU. America is similar to South Africa in that there are many different cultures present, so adjusting to the new cultures here was not a new experience for me."

"The academic subjects I enjoy the most are math, physics, and chemistry, as well as anatomy and physiology. I originally wanted to combine my interests and practice physical therapy. After I volunteered in therapy at Memorial Regional Hospital, I saw that it

wasn't holding my interest or using all the areas I enjoy studying, so friends studying engineering swayed me into the major. Currently I'm working towards a BS in Chemical Engineering, which will lead to an MS in Biomedical Engineering in the combined BS/MS Program. I also work in the CVEC lab on heart valve research for Dr. Schoephoerster."

"I think biomedical engineering is the best of all worlds. It benefits people's health and combines medicine and engineering, but you don't have to deal with the same problems a physician normally would. I think with a biomedical degree, I can go in any direction, although I'm not sure of a specialization yet. Hopefully as I continue I'll see more specific areas that interest me."

Topics in Student Research

>> Stent Design and Platelet Deposition Research at CVEC

Atherosclerosis, a disease of the cardiovascular system, leads to more deaths in western countries than all other causes combined. Research into atherosclerosis is performed to a great extent by biomedical engineers. Two biomedical engineering students — Sam Robaina, a graduate student in the biomedical engineering program, and Bhavani Jayachandran, an undergraduate working towards a BS in Electrical/Computer Engineering and MS in Biomedical Engineering — are performing unique and important research at the Cardiovascular Engineering Center (CVEC).

Atherosclerosis occurs when plaque accumulates on the inside of an artery, causing it to narrow. Eventually, the plaque can dislodge, clog a smaller artery and cause a heart attack or stroke.

To prevent this, a stent can be placed inside the artery. A stent is a cylindrical device that serves to hold the artery open. "We're primarily looking at the mechanical design of stents and how it affects the rate at which arteries will restenose, or relog," said Sam Robaina of his research at CVEC. A stent is made of parts that are both parallel to blood flow, and perpendicular to it, the latter called struts. "The struts disrupt normal blood flow patterns, causing turbulence and stagnant flow. This can lead to platelets in the blood reattaching to the artery wall, causing it to narrow all over again," says Sam.

A solution may be in the spacing between the struts: with a wider spacing "blood can wash out anything that accumulates on the artery wall, but wider-spaced struts have less strength to hold open the artery." Conversely, "smaller spacing between struts has greater strength, but also a greater restenosis rate. We aim to find out what the closest strut spacing can be with minimum platelet attachment." Sam and Bhavani begin by labeling platelets in the blood with a radioactive isotope, and running it through flow chambers to simulate actual blood flow. The flow chambers contain struts of different spacings. "When we run blood through the chambers, the platelets deposit themselves on and around the struts. Afterwards, the platelets can be counted in a gamma counter to let us measure their distribution and number," says Sam. In addition to strut spacing, the team also looks at the platelet deposition patterns for different heart rates (rest and exercise), and different stent materials.

The team is currently analyzing its data and repeating the tests for accuracy. According to Sam and Bhavani, "We hope to set a standard, so that when a manufacturer designs a stent, they'll be able to create one with maximum strength, and a minimum rate of restenosis."



Bhavani Jayachandran and Sam Robaina, BMEI students

NIH Establishes Biomedical Engineering on a National Level

THE NATIONAL INSTITUTES OF HEALTH (NIH) has formed the National Institute of Biomedical Imaging and Bioengineering (NIBIB). The Institute supports a program of research and training and will help translate research into practical applications in biomedical engineering. The Institute, which will coordinate with other biomedical agencies and the NIH, represents a significant leap forward for biomedical engineering at a national level. For more information on NIBIB, direct your web browser to: [http://grants.nih.gov/grants/becon/becon\\_info.htm](http://grants.nih.gov/grants/becon/becon_info.htm)

FACULTY FOCUS

>> Dr. Juan Franquiz



The "Faculty Focus" aims to allow readers to learn more about a Biomedical Engineering faculty member, including aspects not related to engineering.

"I'm married with one daughter and I'm from Havana. I went to College and University there, and received a BS degree in Physics from the University of Havana. After Havana I went to Prague, in the current Czech Republic, for graduate school, on a fellowship from the International Atomic Energy Agency. I spent three years there working at the Clinical and Experimental Medicine Institute of Prague. And then I received my MS in Medical Physics from the Technical University of Prague. Prague's a small, very nice town. It's one of the few whose architecture wasn't destroyed during World War II."

"After I completed my work in Prague, I returned to Havana to work at the Institute of Cardiology. I traveled to Vienna on an academic visit, and while there I defected and was granted political asylum in the United States."

"I took this opportunity to come to the University of Florida to work on my Ph.D. degree and specialize in medical image processing and nuclear medicine. I also had other family members residing in Florida at that time. After my time at U.F., I worked at Washington University in St. Louis for three years before coming back to Florida to work at FIU."

"Besides Engineering, I currently have interests in history, especially collecting old books on history, particularly those focusing on the Spanish-American War."

Dr. Juan Franquiz joined the BMEI faculty as an Assistant Professor in February 2001.