Graduate Education and Research Committee of  
Biomedical Engineering Advisory Board

October 31, 2007

Attendees: Malek Adjouadi, Anthony McGoron, Steven Ponder, Stephen Rowland

Dr. McGoron went over the History and Accomplishments of the BME Department.

Discussion of the Function of the Advisory Board
Our BME Advisory Board is more involved than any other board. We have divided our Advisory Board into 4 committees. The consensus was that not much was accomplished meeting with 40 members at a time. Input may be more valuable within specific committees. This specific committee’s focus is intended to be research, advising us on how to promote our research efforts with our board members and what our research focus ought to be and improve our interactions with the companies here in doing practical research and helping us design and evaluate our graduate program, whether our graduate program is doing what is supposed to be doing. In addition we are undergoing SACS (Southern Association of Colleges and Schools) accreditation for our graduate and undergraduate program and we need to set up a plan and to evaluate that plan for accreditation. We are 6 months behind in coming up with a plan to get accredited, continual improvement is most essential. The SACS process for the undergraduate program will come directly from ABET, but the process for the graduate program is brand new. We need to develop it from scratch.

Chair and faculty search. We have a Search and Screen Committee made up of some of our faculty and faculty from other departments and our board. For the BME Chair search, we are disappointed with our search, not enough applicants. It has been difficult to get good senior candidates to apply, possibly due to location being in Miami. We have decided to wait until January to re-advertise the position. We are getting the permission to start the search committee for the junior faculty.

Center of Excellence Program

Three years ago the state put up 30 million dollars to develop Centers of Excellence for Research in Florida. We applied for one of those grants as a sub contractor, as a subordinate with the University of Florida, we did not get awarded. Last year we submitted a grant for bionano sensors to piggy back on the infrastructure and the priority that Dean Prasad put into the nano fabrication facility downstairs. It was a natural fit because the new faculty focused on bionano sensors and applications and it was a perfect fit because we got a big donation from Motorola, and the university was investing in that. But we did not get awarded and we were surprised and disappointed we did not get it. This year the state put up 100 million dollars, they want a minimum of 10 million dollar
proposals, they want a big push. The effort here is not research but economic development. The Centers are supposed to promote and eventually lead to economic development, such as job, patents, intellectual property, working with companies that are going to commercialize the product. It is not about basic science. For this year’s proposal we need the commitment from our Advisory Board members and companies. Our focus this year is broader in terms of concentrating on toxins, toxins exposure, and toxicology, in-vitro diagnosis, monitoring exposure to either environmental or chemotherapy toxins, sensors and devices. We are talking about developing sensors and devices and procedures to monitor level of toxins and monitoring biological response to toxins. Optical imaging technique is going to be one of the thrusts to be included. We chose this theme because the primary investigator on this proposal is going to be Joe Leigh Simpson from the College of Medicine. It is going to be out of Medicine even though the technology is from the College of Engineering but the effort here is to solidify our position in College of Medicine. His background is rapid detention of rare cell types, genetic abnormality in area of reproduction; his area is in sperms, eggs, gametes and understanding genetic deformation. Our focus is going to be on reproduction but using his expertise. It is going to be 12 million dollar proposal, some of it will go to UF, MDC, EDC and Florida Gulf Coast are also going to be involved.

This proposal is due December 3rd. Jane Teague and Jon Sussman will call to get better feedback from members. Dr. McGoron stated that within the week he will look into presenting the proposal to board members and companies.

Regarding the issue of improving IP office here at FIU: it is getting better but it is still not the best. Dean Prasad arranged with VP Walker to develop a fast track program for this process. The problem is that it takes very long to review any IP that come from the university. Other problem is that our legal takes too long.

There was a discussion about pro’s and con’s about investment from companies.

**Graduate Program**

We made a change to our Masters program. We have 2 MS tracks: one is the Research track in which they have to do a thesis and are supported to do research. It could be basic hypothesis driven research; it can also be design or development.

The Professional Track MS was initially intended for students working full time for the industry who wanted a Masters degree for promotion, most students came from Cortis. They would do a project instead of thesis, and the project would be associated with their company and confidential. However, now we have many MS students that are supported only as teaching assistances and not research assistants. They get a minimal (half) stipend which qualifies them for in-state tuition rates. However, these students do not receive tuition waivers. They are expected to do a “project” rather than a formal thesis.

After we started our PhD program now we only support the PhD students with full stipends and tuition waivers. We do not support our MS students except as TA’s. It is not
fair for the Masters students who are doing a thesis not to get supported because they will need to be in the program longer than their support allows. Now the emphasis is on graduating our Masters students that might be here full time and maybe even be supported as teaching assistant but they do a project. Non- (or minimally) supported students did not want to take the engineering management courses. So we basically took the research track and told them to do the same courses but instead of 6 hours of thesis they do one extra 3-credit hour course and 3-credit hour Masters Project. They can take up to 2 management type courses if interested in engineering management. The board’s input was that this is going to generate master students with qualifications valuable to the industry. Dr. Ponder stated when he hires he would want these students to have some research experience rather than the business aspect for industry. Dr. Rowland said that he would want to see experience and independence.

We have 2 different groups of students: US educated students, with intensive design components. Another group is made up of foreign students and most do not have senior design. Non-thesis (Professional Track) students should be forced to get more involved with Senior Design. It was mentioned that in some European countries some BS students have to do thesis in their program. Dr. McGoron posed the question: Is a Masters thesis essential in hiring? Most of our students who are not supported want to do a thesis; they think it gives them a better chance at jobs.

The project has to be defended to a committee but it does not have an extra level of scrutiny as the thesis (it doesn’t get approved by the Graduate School). Dr. McGoron wants input from board in making a decision as whether to request a thesis or a project. Students should define in their job interview if they did a thesis or a project. Our faculty needs to keep up the level of our projects. Both industry representatives stressed that the specific skills that the student brings to the company is more important than if they did a thesis or not. If they do a project rather than a thesis, did they obtain the specific skills the company needs? This will come out during the interview process. Some jobs require more research skills, some more design and development skills. Students need to be able to communicate what they have achieved in their program. They need to show how enthusiastic and excited they are, how they can solve problems, what analytical skills they have how they approach a problem. These are more important than whether they have done a thesis or a project.

The College needs to coordinate internships for projects with well defined deliverables. But, the company doesn’t work on the academic schedule, so it is difficult to coordinate projects for students that must be done in a semester. We need to make sure the advisory board understands the value if supporting our students and sponsoring their research.

Maybe the university can share funding agency RFP’s with our industry partners to get them more involved. Specifically we need to share SBIR and STTR calls from agencies with our industry partners. The Department needs a person that can coordinate with our industry partners to make them aware of our resources and visa-versa.
**Assessment Process: ABET/SACS.** Dr. McGoron went over the 5 column spreadsheet Student Learning Outcome Assessment. The requirement to assess graduates is welcome because it is important. What is being measured? What is the student learning specific to their discipline. It is much like ABET criteria. Dr. McGoron went over the list as how to measure the outcomes. He mentioned that there are 2 ways to measure outcomes: at the time of graduation and how they are doing 3 to 5 years after graduation. This assessment should not depend on scores or test grades; they should be more objective for a more solid measurement: Resumes, how well they can communicate, how they interview, analytical skills, enthusiasm, publications, presentations, involvement in societies. We should maybe have some type of survey for thesis/project to test analytical skills as now it is just pass or fail. Dr. McGoron would like to get the board’s input at a later date. If we knew exactly what the companies were looking for then we could more objectively assess our program that we are graduating student with the skills needed by industry.

We want to prepare students. Dr. McGoron asked for recommendation from the board for research opportunities for students and faculty. We do not have enough extra mural funded research for all students that want to come here. We turn down many students. We need more research opportunities, not necessarily supported opportunities, projects, ideas they can work on to provide them with experience. We need a coordinator for industries to work on a joint internship, to encourage industry meeting up with sponsor research. Dr. McGoron wants to know what the companies of the advisory board members are doing, wants to give that information to our faculty and other department for possible collaboration. Ideas are welcome from the board.

**Senior Design.** Last year the senior design external evaluation was done only during Spring semester. However, during the summer there were very good projects, some of the sponsored by companies on our advisory board. ABET wants quantitative data with graphs but Dr. McGoron thinks there is room for a paragraph explaining that the feedback from our sponsors was very positive. This may help show that those projects were evaluated “externally”. If the companies that sponsored the projects were happy, then that will demonstrate that the students did quality work. Senior Design is the most important component of any undergraduate engineering program and when ABET comes in and if all they see is is good Senior Design with good output and good input the rest is to check to see if you have the faculty, the administration, etc. If you are great at everything else, but students can not design anything then that is a drawback.