Attendees:
Michael Christie
Paul David
Jeffrey LaRose
Juan Lorenzo
Hamid Shahrestani
Michael Brown
Professor McGoron
Olga Cepero-Diptee

Professor McGoron introduced himself as the Acting Chair, Michael Christie as the new Undergraduate Advisor and Michael Brown as very active in the ABET team.

The purpose of the meeting was to evaluate/review the BioMedical Undergraduate Program with the Advisory Committee and to list the changes recently implemented to our program as a result of earlier ABET visits and also to get their feedback to help us with continuous improvement and preparation for the ABET accreditation. This review included a detailed explanation of objectives and outcomes. Professor McGoron thanked the attendees and commended the Advisory Board as one of the most involved and dynamic in any university.

Professor McGoron presented a brief but thorough history of the BioMedical Department from its inception ten years ago.

Changes implemented as a result of the previous ABET visit: ABET questions courses that look like science. In order to ensure that students take sufficient number of “Engineering Topics” credits (at least 48 out of the 128 total credit hours in the program) we removed the Molecular Biology course and added a 4th elective. Our program was developed to emphasize Cell and Tissue Engineering and Biotechnology and not just fundamental engineering. Michael Brown teaches the clinical contents in Engineering Analysis of Biological systems I and II and also in Clinical Rotations. Our program teaches analysis of technology, budgetary planning, design validation, terminology and lingo. Students learn the concepts hands-on and implement them and prepare them for future job interviews. The committee emphasized the importance of the fundamental engineering to the students and that the program must ensure the students get the fundamental engineering in addition to the biotechnology. The students get breadth (BME 3032 BME Transport, EEL 3003 Electrical Engineering I and EGM 3503 Applied Mechanics) but are they getting enough depth? The students need to choose their 4 electives to gain depth and help them define what type of biomedical engineer they want to be in practice.
ABET regards Senior Design to be very important. They were not happy with our Senior Design and thought that half of our program was research projects, not design projects. Therefore, we revamped it and made sure that expectations were clear not only to students but to faculty. Our Design Competition is now a whole day affair and students really get involved. The metric and the external evaluation are used to evaluate the presentations to see if every single outcome was met. Another criticism is the ABET requirement of a 2.0 average GPA which encouraged students to take such courses as basket weaving to bring up their GPA. This also poses the possibility of faculty inflating the students’ grades. We decided from the beginning that D- is a passing grade and if a student graduated with a low GPA it would be difficult for him to get a job. However, to address the low scores in engineering courses, we added the following requirement to our program “Students must maintain a cumulative GPA of at least 2.0 in all Engineering courses” We also instituted that students take 10 seminars at zero credit; we have many seminars to cover life long learning.

Courses of Action: Michael Brown is in charge of Clinical Rotation tours and he asked the advisory board members to volunteer their companies to offer tours and internships to our graduates. Hamid Shahrestani stated that Biomedical Engineering is still a fuzzy name and this makes the job description a bit difficult. In order to help our graduates prepare to better sell themselves to the industry, we could allow them to add specifics to their transcripts since we do not do ‘tracks’. Jeffrey LaRose indicated that when he interviews, he assess personalities and attitudes and tries to match the applicants to the job description. Juan Lorenzo indicated that he does the same and he interviews according to the inclination of the applicant be it mechanical, electrical, etc.

Are we meeting our objectives? Are our outcomes met?: Professor McGoron defined quantifiable primary verification metrics of program outcomes and went over the Verification and Validation loop. He stated that the validation loop evaluates our objectives 3 to 5 years after graduation and since the previous accreditation did not include validation, this coming accreditation is going to be critical. The verification loop has 8 outcome measures. He listed the 4 primary outcome measures used: senior evaluation, senior design faculty assessment, lab course assessment and student exit survey. Secondary outcome measures were cited: course outcome; exams we give students and individual courses are reviewed; transcripts are randomly pulled to assess if engineering topics are missing; if the students are taking the courses in sequence; if they are being allowed to take courses without the pre-requisites; and we also ask students for a resume when they leave to see if they were involved in school activities. We need to ascertain if the tools we use to collect and evaluate data are correct. We have changed our curriculum based on this outside input. ABET was happy because our data is not all anecdotal information; we have quantified arbitrary information using the metric.

External Evaluation: Professor McGoron received feedback from the Board on the evaluation forms, tables, and definitions of outcomes. ABET was not happy that we did not define what a Novice or Apprentice is for instance. We are trying to objectively evaluate our program. Professor McGoron discussed the forms used to evaluate our lab
courses. Since we do not have enough of a sample size there are too few students to show a trend. It was suggested that a new column be added to the metric to match the faculty and the external evaluation. Our students can not graduate unless they have a C average (2.0 GPA) in their engineering courses. Looking at the metrics, we are not meeting our objectives and if we do not meet the outcomes it could be due to various reasons: students are not learning Calculus from the Math Department; Design Lab does not design experiments due to lack of resources or time; English is the second language for most of the students and that is the reason why students miss most of their marks. We discussed that we need to have the Senior Design presentations competition with the external evaluation during both Spring and Summer. We will implement that in Summer 2008.

Hamid Shahrestani noted that some students take BME 4800 (Design of Biomedical Systems and Devices) but not BME 4090 (Design Project Organization). These are students in Minor program. These students don’t continue on with Senior Design in BME. We discussed combining BME 4090 and BME 4800 into a single 4 credit-hour courses because they are currently integrated anyway. They really shouldn’t be taken separately. Also, if a student fails once courses, they really should fail both since they are integrated. This will be discussed further at the retreat.

The problem of statistics came up. Students appear to be getting enough statistics, but are they using it? Need to incorporate more use of statistics in the BME labs and also the Senior Design course.

It was discussed that there are really three different areas that students will find themselves after they graduate: (1) doing modeling (2) doing research (3) as design engineers. We need to help students define which of the above are their strengths. The process can help them concentrate on that in the BME program. These strengths should also be reflected in their resumes to help them define which type of biomedical engineering they are.

Are students getting enough drawing experience? Need to make sure we get drawing into the courses so that they gain that experience.

Need to make sure students understand intellectual property (IP) issues. We have another committee working on proposing was to improve the IP office at FIU, but students need to be more aware that the ideas they have for their senior design projects can be patented.

**Alumni Survey and Employer Survey:** We are now collecting the Alumni Surveys. We have sent about a third and have received back about half. Paul suggested that these students’ surveys be done electronically. That will be implemented in the future. But, given the small number of graduates, and the lack of resources, they will be done electronically in the future. Professor McGoron stated that Manny from our office contacts all students to encourage them to complete the survey. We ask them to rate our objectives. Paul David suggested that we be more specific: we should ask students if they are employed and by whom; if they are going to pursue an advanced degree and if so what major they are pursuing; which college they are attending or if they are pursuing an
advanced degree out of the field? In regards to the Employer Survey, Hamid Shahrestani suggested that we should also identify who should fill out the employer survey. We should indicate in the form the most appropriate person is to provide the information (immediate supervisors as opposed to H.R.). He also suggested that we should indicate in the form whether the student was hired directly from the college and if this is their first job. Juan Lorenzo indicated that salary or working title information is really of no value for our purpose but the drug or device they are working on is. We want to tie the information obtained in these surveys to our objectives. It was suggested we should drop the entrepreneurial endeavors question. The Alumni and Employer surveys will be updated and presented to the faculty at the annual faculty retreat in December. Any changes to the surveys will be made so that the data can be integrated with the data from the surveys that have already been received.

We need to be prepared for the ABET visit in November 2008. The Self-Study report is due July 1 2008. This meeting’s main purpose was to look at the tools (primarily the Alumni and Employer surveys and the tools to evaluate the program outcomes) to collect our data to prepare for ABET. It was added that we need to facilitate the Miami Dade college students to enter our program with their AA. Dr Christie will work with David Paul from MDC to prepare MDC students for FIU’s BME program after their AA. The possibility of creating a discussion forum or Blog came up.