Biomedical Engineering  
Undergraduate Education and Accreditation Committee  
Friday, October 10, 2008

**Attendees:** Dr. Michael Christie, David Paul, Steve White, Hamid Shahrestani, Dr. Michael Brown, Dr. McGoron, Dr. Godavarty, Werner Blumenthal, Dr. Byrne, Olga Cepero-Diptee.

The meeting started with an introduction of all present in the room.

We had previously mailed a packet to all the Advisory Board members with the following documents:

- Undergraduate Education and Accreditation Committee Minutes (November 15, 2007)
- Biomedical Engineering Program (08-09 Curriculum)
- Program Learning Outcomes
  - Program Learning Outcome Measures Results
- Program Objectives
  - Program Objectives Data
  - Employer Survey results
  - Alumni Survey Score results
  - Advisory Board Members’ Survey Score results

**Reference Material:**
- Taxonomy used for Senior Design External and Undergraduate Laboratory Evaluations
- Exit Survey Template
- Senior Design Project External Evaluation Template

We reviewed the material and the results of data with the members and faculty. Dr. McGoron stated that we continue to make changes to our program in order to improve it. He recalled that in our last year Undergraduate Education and Accreditation Committee of 11-15-07 we had reviewed the preliminary learning outcomes but at that time we did not have any objective data. At that meeting it was recommended that we make some changes to the **Taxonomy used for Senior Design & Undergraduate Lab Evaluations** in order to best define levels of competency of our students and we have since made those changes. Dr McGoron asked the members to give us feedback regarding those changes at some point later on, using the provided material as even the new terms may not be appropriate (**fair, good, very good, excellent**). Another suggestion was to have the Senior Design Expo in summer too, which we did. This summer 2008 we had 4 groups and 4 judges. We now will need more volunteers to judge the competitions as there will be more competitions.

Two other problems were discussed at that meeting: that our students are not very good at calculus and differential equation, we need advise from the board to help us change our...
program as to make students more proficient in designing experiments. We are currently working on student communication skills by asking for more reports and will require writing and speaking courses. Another item that was suggested but we never did go forward on implementing was the possibility of combining the 2 Senior Design courses, as the first course is for learning, the second one is for practical (BME 4090/BME 4800). One downfall to this combination would be that students taking a BME minor will be affected, now only the first class is mandatory, we will have to consider designing a new course for those students.

We now have more statistics courses but our students do not get any drawing experience. Steve White suggested teaching it in Applied Mechanics which Dr. Christie teaches now, or we could offer as an elective. Faculty had previously decided to have all Senior Design students attend 7 one-hour mandatory lectures on engineering practices (a lecture to be given every other week).

The Articulation Agreement between FIU and MDC was discussed in detail by David Paul which will facilitate MDC students to enter our program with their AA. It will be made clear to students that they will be expected to take extra courses at FIU. David Paul suggested to make sure ABET knows about this Articulation Agreement as education partnership will help our accreditation process.

It was discussed which would be best for students in the Senior Design: breath or depth in order to be successful in getting jobs. Our program was initially created to be more slanted towards sciences than engineering but ABET wants more engineers. Steve White suggested we benchmark against other institutions. He opined that in order to get jobs students need more advanced research, good understanding of mechanics projects and management as well as advanced product development; they may have to deal with doctors so they also need good communication skills, we should re-evaluate our electives. Dr. Godavarty suggested offering tracks in electives and official certificates stating student is qualified for that specific track at time of graduation. David Paul stated that these certificates should be authorized by the State (and the Dean of course). It was suggested having students create a portfolio which could be used for accreditation purposes and to give student an edge in job interviews. This portfolio would contain an executive summary for each course and it will aim to show student skills, not details of classes. It was suggested also to help students create better resumes and faculty could review and edit them. Dr. Shahrestani presently gives students feedback regarding resumes. The target of a resume would be to tie what they have learned with the 8 learning outcomes and with specific objectives.

The FIU BME Program Continuous Improvement Process was reviewed (verification/validation). It was discussed that the program objectives are subjective; we need more direct measures outside of grades. For this ABET visit we can only make suggestions, after the ABET visit we can make wholesale changes, we may have to modify the objectives. We went over the Outcome data (table 3.8 and 3.9). Dr. McGoron called attention to the Senior Design External Evaluation data where we did not reach the targeted range: it could be because the external evaluation is not a good way to assess our
students or that the projects do not demonstrate what students are learning. Steve White proposed and wrote in the blackboard to take the scope of the project and compare it to the outcomes, to map them in the project. Only projects where all outcomes are reflected in the project by a 50% margin should be chosen. The way it works now is that all 8 outcomes have to be met in the Senior Design, we designed our assessment to meet all outcomes but this is not a fair assessment, it is very difficult to put all 8 outcomes in one project. We are grouping to have one course where all 8 outcomes are met. This needs to be re-evaluated after the ABET visit. Dr. Mcoron stated that the Program Outcome folders have to have all courses, not just the Senior Design.

Dr. Christie made a presentation of our objectives using data from our Alumni Surveys. The actual surveys were modified based on suggestions from this committee last year.

We should come up with examples of learning modules to introduce to students. Werner Blumenthal volunteered to find out what CAD has to offer to universities (he is going to a conference). It was decided that we are going to ask our industry partners what statistic package they use so we can modify our program accordingly.