Minutes of the NMSU Department of Physics, Engineering Physics Advisory Board Meeting
(April 13, 2007)

Present: M. DeAntonio, M. Engelhardt, T. Hearn*, B. Kiefer, G. Kyle*, H. Nakotte*, C. Pennise*, I. Vasiliev, (NMSU Physics); P. Furth (NMSU E.E.); R. Pederson and Y. Park (NMSU M.E.); J. Haas (NASA); J. Leonard (Raytheon); M. Schrod (Las Alamos National Laboratories); R. Tefoa (Intel); M. Humberstone (EP graduate, 2006 attending University of Tennessee)
Absent: E. Fernandez*, S. Pate*
* Department of Physics, Engineering Physics Committee Member

1) G. Kyle opens the meeting at 8:10 AM with introductions, followed by a BSEP program overview.

- Schrod asks about the research overhead charge. It is 50 %.

2) T. Hearn gives a presentation on the ABET accreditation process. A discussion ensues.

- Leonard asks about the importance of accreditation. Hearn, Kyle and Nakotte respond that it is important to the employers. Often if employers are paying for an employee's education they will only pay if a program is accredited. Hearn adds that accreditation is important for the program overall. A discussion follows about accreditation of the Physics program as well as EP.
- Schrod asks if there are advantages to the EP program being "across-colleges".
- Haas comments that as a result of last year's EP Advisory Board meeting J. McNeil recommended that Outcomes a – k be used as stated rather than the use of program specific/program defined outcomes. Nakotte and Hearn respond by stating the Department has "kept it simple" for now by using the Outcomes as stated.
- Tefoa asks what the toughest outcomes were. Nakotte responds that they were F (professional responsibility), H (societal impact), and I (life-long learning) and that Alumni responses may be the best way to address these. Haas comments that CO School of Mines uses that approach.
- The importance of critical thinking skills and the ability to recognize if a solution seems correct or not is raised and a discussion follows. Humberstone gives an example of the importance of good critical thinking skills by stating that students often are caught up in the specifics and/or math.

3) H. Nakotte gives a presentation on Curriculum issues. The following questions were raised:

- How did Humberstone cope with the "stealth" ME prerequisites? He answers that he took ME338; had ME326 waved because he took ME426 for his Capstone.
- Where do University General Education requirements come from? Answer: The State of NM Department of Higher Ed.
- Do the Gen. Ed. requirements dilute the technical requirements? No specific answer was given.

4) P. Furth gives presentation on the EE program and raises some Gen. Ed. Issues. The following questions were raised:

- Why the declining engineering enrollment at NMSU? Answer: Possibly due to growth at NM Technical University and there is a national trend to lower enrollments.

- Can the Gen. Ed. requirements be satisfied in the engineering curriculum? Answer: No, must be from State approved list.
- How do changing requirements affect students? Answer: They don't, students come into the program with a curriculum in place and that set of requirements is then fixed.
- What is the impact of common discipline-specific core numbering? Answer: Motivation to facilitate transfers.
- Issue comes up about the Community Colleges teaching introductory courses and possible impact on quality.

Furth discusses possible changes to the EE program in response to Gen. Ed. and increases in math credits.

5) R. Pederson gives presentation on the ME and EPME changes due to Gen. Ed. and math requirements. He comments on the difficulty of fitting this into the 128-credit requirement.

- A discussion then ensues about the Viewing the Wider World course requirements and some problems these courses pose to students.

6) H. Nakotte gives a presentation which addresses Capstone issues for EP students and the Physics Department. He suggests the Department develop our own Capstone projects for EP students.

7) Y. Park gives a presentation on ME Capstone projects and comments that the students were positive about their experiences. Haas raises some concerns about support across Departments.

8) H. Nakotte give a presentation focusing on: curriculum, advising, retention and future opportunities for the Physics Department. He comments that Institutional support is poor and/or dwindling and that the possible cause of this is that the EP program is outside of the College of A&S. He states that there have been 5 EP students who have graduated to date and that the Department is perusing possible future EP programs with Chem. E and Aerospace options.

9) H. Nakotte distributes handouts on recruitment and discusses the on-going efforts within the Department. As a result of our efforts about 50 students had expressed an interest in the Physics or EP programs. He expresses concern about the ability to accommodate this potential increase in students due to the impact of the impending move out of Gardiner Hall and the potential loss of about 30% of the building space due to eventually sharing the building with the Department of Geology.

One recruiting method that the Department used and seemed to be effective was for a Faculty member to call potential students and discuss the program with them. The response seemed positive; the students liked the personalized approach.

10) H. Nakotte begins the Open Meeting at 1:30 PM with introductions. A question and answer session follows.

- Haas asks how the ABET requirements effect teaching. Answers: Engelhardt states that it adds structure and forces efficiency. Vasiliev says it incorporates real world applications (a contemporary perspective) to the textbook, which normally don't discuss the most recent developments. It incorporates problems which require approximations, not just "cookbook" type questions and reports based on research papers.

- Leonard asks the following questions:
  - Why don't the textbooks incorporate the latest models? Answers: Texts are too old.
  - He asks some specifics about properties of materials, nanomaterials modeling them. Answers given.

- Some discussion on the importance of library searches, critical thinking and its use in applications to "unrelated fields".
- Engelhardt asks Humberstone: 1) if there were any gaps in his learning? He discusses the usefulness of theory/application dichotomy and mentions that there are limits on what to include in a 4-year program; 2) are any changes in priorities needed? No.

11) At 5:30 PM the Wrap Up session begins –

- Questions are raised concerning Engineering recruiting and Physics Faculty involvement.
- Program positives noted:
  - The Department should continue doing what we are doing since the students are positive and the Faculty has "bought in".
- Program challenges noted:
  - Curriculum, dependencies of Physics on Engineering Departments
  - College of A&S ownership
- Decrease 128 credit limit (?); is it inevitable (?).
- The Aerospace and Chem. E. options would be good programs to add. The Aerospace option fits well with the State priorities.