1. **Assessment information collected**

   As part of the EAC’s ABET accreditation process, outcomes “a – l”, which describe what students are expected to know and be able to do by the time of graduation, are routinely assessed. These relate to the skills, knowledge and behaviors that students acquire as they progress through the program. The data that is collected basically falls into two categories: (1) direct and (2) indirect. Direct assessments are based on student work (e.g. embedded exam questions) while the indirect assessments are based on senior exit surveys. Since the last ABET visit in fall of 2011, the outcomes are assessed only for the key courses such as petroleum reservoir rock and fluid properties (foundation course); rock and fluid properties laboratory (mainly for written communication); reservoir, drilling and production engineering and ultimately the culminating senior design experience.

2. **Conclusions drawn from the information summarized above**

   (1) Direct outcomes assessment indicates that they are met at a fairly high level (see example shown in Figure 1 and 2 respectively). Something that needs to be noted though is the fact that this varies significantly with the quality of the incoming students from year to year.

   (2) Exit surveys indicate that at the time of graduation, students are generally satisfied with the level of skill development (related to some of the outcomes) and the fulfillment of their expectations as far as the BS program is concerned.

   (3) Despite the high enrollments, we have maintained a near 100% placement of our graduates, which also is an indication that the education they are receiving is preparing them for careers in the oil industry or graduate school.

3. **Curricular changes resulting from conclusions drawn above**

   (1) Based on the outcomes assessments in every course, instructors make their own modifications to effect continuous quality improvement for applicable outcomes.

   (2) It has been our observation that the students are unable to be effective writers (ABET outcome “g”). To that effect Professor Carr from the writing center was invited to give a small workshop to all the senior design students in February 2014 to help them become effective technical writers. We plan to continue this in the future years as well.
(3) Other actions are based on indirect feedback such as surveys and/or curricular experiences of PETE faculty given the students’ performance. Examples of those include: introduction of PETE 101 (combines the four 100-200 level courses to cover substantial material of petroleum engineering so that the students are better prepared for internships early in their program), pre-requisites changed for PETE302 (new pre-requisite is PETE301 since the knowledge of rock and fluid properties is essential for proper understanding of well log interpretation), and PETE407 (new pre-requisite is PETE 476 since knowledge of reservoir engineering is essential for proper understanding of petroleum production as the production process starts with the reservoir itself). The last two pre-requisite changes are made in order for the students to take the courses in proper sequence to enhance their learning experience.

(4) PETE faculty are also currently considering the introduction of new pre-requisites for PETE487 (senior capstone design) and that will be rather than leaving the pre-requisite as senior standing, will include “must have taken at least any of the two 400 level courses, i.e., PETE407, PETE426, PETE476 prior to registering for PETE487. This way the students will have knowledge of at least two of the three key petroleum engineering disciplines to effectively work on an open ended capstone design problem.

4. Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting

Primarily, Abhijit Dandekar (PETE chair and ABET coordinator). All other PETE faculty are involved in the outcomes assessment in their respective courses and the curricular changes is a result of collective faculty decision.
Figure 1: Outcomes (a, b, e and j) assessment (PETE301, fall 2012).

Figure 2: Oral communication outcome (g) assessment (PETE426, spring 2013).