Executive Summary of Department Review – Mechanical Engineering

The departmental review was scheduled on December 3, 2013. The members of the committee constituted were Dr. P.K. Vijayan from BARC, Prof. T. Sunderarajan from IIT Madras, Prof. V.K. Jain from IIT Kanpur, Prof. G.K. Ananthasuresh from IISc Bangalore and Dr. Pawan Goenka from Mahindra and Mahindra. All members except Dr. Goenka participated in the process.

The review process started at 9:00am with the HODME making a presentation to the committee regarding the activities in the department. A hard copy of the entire presentation was given to the members even though the 'soft copy' had already been sent to them earlier. The committee noted the following:

-the department has 44 faculty members and is grouped into three major groups i.e. Thermal and Fluids Engineering(TFE), Manufacturing Engineering(MFG) and Design Engineering,(DES).

- BTech students can either do a regular degree course or an honors course where a BTech. Project is compulsory. The department caters to the Drawing and Workshop courses for the entire institute. The department offers a minor to other departments but it is not very popular. Currently TFE BTech. Core courses are split into two classes of 75 students each.

-the department offers MTEch. in TFE, DES and MFG streams. The department also offers Dual Degree programs where students get a BTech.and an MTech. Degree in all the above streams. However admissions at the first year level are restricted to the DES and MFG streams only; the department admits students to the PhD program also and on an average each faculty has about three students.

-The department offers Rs. 10000/- to PhD students in addition to the support provided by the institute for conference travel. The department also offers Rs. 30000/- to all MTech. Students combined and Rs. 30000/- to all BTech. Students combined for conference travel.

-the department is attempting to provide seating space within the department for all PG students

-More than 90% students in UG and PG programs get offers through the placement cell.

-The faculty in the department actively seek funding from outside agencies averaging about 12-13crore/year. Funding is mostly government but recently NCAIR with major funding from Boeing has been set up. On an average 25 lakhs/year of consulting revenue is received

- The publications average at about 1.8/year in journals and 2/year at major conferences

- Faculty members receive several awards and several are on the editorial boards of international journals.

- The department has several teaching and research laboratories whic the committee members would be visiting.

The committee started the laboratory visits at about 10:30am. All laboratories were included in the visit and the scheduling was done to keep the transit time between laboratories to the minimum and therefore the teaching and research laboratories were visited together. A few laboratories were visited after lunch and the visits ended about 3:00pm. Faculty involved with computational work made short presentations to the committee regarding the research work that they were involved with since they were not part of physical laboratories. At 4:30pm the committee interacted with a few BTech. MTech. and PhD students of the department for about half an hour where the students raised some issues regarding internship, general ambience of the department, job opportunities etc. After that the committee interacted with the faculty members of the department for about half an hour where no major issues were brought up. The members then, individually, filled out the form given to them and expressed their views.

The main comments of the committee members are summarized below:

-the students requests with regard to takin up internships of long durations should be entertained but it should not be at the cost of the academic program. Some software intense courses should also be included in the curriculum to better prepare students for the 'job-market'. DD students should be admitted after they have spent a couple of years here and not at the JEE level. The number of undergraduate core courses in manufacturing engineering should be increased. More advanced courses should be introduced. Some UG laboratories should be upgraded especially Workshop and Drawing. 'Hands on' projects should be introduced and labs must be made open ended. BTP must be made compulsory. PhD students should take more courses.

-the research laboratories are impressive and the department has done well to recruit motivated faculty members who are engaged in exciting research. More efforts should be put in, to hire faculty in the DES and MFG streams. The idea of involving PhD students in teaching and also involving adjunct faculty for teaching should be explored to leave regular faculty to do more research. Publication indicators for department should improve. The research should be more application oriented.

The comments were subsequently discussed in a Departmental Faculty meeting. The issue of the necessity of including BTP in the curriculum as well as operational issues in executing such a step were discussed. It was decided to continue with the current option of keeping it open to students but not making it mandatory for all students. The issue of conducting advanced courses was discussed and while no decision was taken, the general feeling was that the individual faculty can think about the course content for such a course and offer it if they wish to do so. A more 'hands on' measurements laboratory is being planned. The issue of workshop modernization was discussed by a small subcommittee. It was decided to first procure four 'bench-top' CNC machines and modify the existing course for the MED students and based on the experience formulate a policy for modifying the course for all the first year students – the order for the machines has been placed and this activity is likely to start shortly. Even though the committee did not visit the Drawing Hall, they were informed that the modernization of this course is also in progress and computers and 3D printing machines have been ordered to cater to this course.