

B. ACCREDITATION SUMMARY

1. Students

Our students are excellent, highly motivated and perform well in a demanding curriculum. Approximately one quarter of them gain work experience and support their education through participation in the co-operative plan and many others support themselves part time through internships, etc. Our graduates are recruited by a variety of companies, government entities and graduate programs.

The student population in Mechanical Engineering is diverse. About eight percent of our undergraduates are women and eleven percent are underrepresented minorities. Many are the first in their families to attend college. Of the 270 students who are currently enrolled in Mechanical Engineering, 162 (60%) entered Auburn University as freshmen and the rest were transfers from other schools. Formal transfer programs exist with a number of schools in Alabama.

The average ACT score of last year's freshmen class in Mechanical Engineering was 25.5 and the average SAT score was 1189. According to the last available data for students, about sixty percent entered as freshmen and completed their degree requirements in an average 9.7 semesters (these data include both co-op and non co-op students). The average GPA of Mechanical Engineering juniors and seniors (fall 2003 data) was 2.83 on a 4.0 scale.

For the academic year 2003-2004, 110 Mechanical Engineering students were co-ops, out of the 270 currently enrolled, or 40% participated in the co-op program. More Mechanical Engineering students are enrolled as co-ops than any other discipline in the University. In fact, the number of Mechanical Engineering co-ops represents 21.5% of the total number of co-ops in the University and 26.3% of the College of Engineering co-op students. During the last academic year only 9 of our graduates earned the co-op diploma that was about 15% of our academic year graduates. This was an unusually low number of graduates and co-ops. It is more typical for 25% to 30% of our graduates to earn the co-op diploma. The conversion to semesters has also resulted in additional internship opportunities and a broader set of student work experiences.

During the calendar years of 2002 and 2003 a survey of 117 graduating seniors was taken. Of these seniors completing the survey, 37% had accepted a job and 20% were going to graduate school. The average annual starting salary was \$46,000. The graduating senior survey is voluntary although we strongly encourage every graduating senior to respond. The response rate for 2002/2003 was 75% and , therefore we believe is statistically accurate. Additional information on students is found in Appendix II, Institutional Profile.

1.1 *Undergraduate Student Advising*

The Undergraduate Program Office is the primary source for MECH undergraduate student advising. This service is provided to students who have completed their freshman year. The Freshman Advising Office carries out advising duties for all engineering students centrally during a student's freshman year. Tight coordination between the Freshman Advisors and the MECH Undergraduate Program Officer (UGPO) ensures a seamless transition. This interaction is particularly important for transfer students. Both offices examine each transfer student's transcript in order to assess the courses that will transfer.

Dr. Sushil Bhavnani serves as the Department's UGPO. Dr. Bhavnani has been a faculty member in this department for 17 years and has served in this capacity for six years. The Academic Advising Assistant, Ms. Karen Clark, assists him. Ms. Clark handles routine student queries, directs students to

done two ways; the University's on-line record-keeping tool, OASIS, and a hard-copy folder maintained centrally in the Freshman Advising Office. All students are strongly advised to regularly meet with Dr. Bhavnani to assure that they progress smoothly through the program and to help them with technical decisions such as elective choices. Practically almost all students interact with Dr. Bhavnani regularly although there is no required meeting with the exception of a major change in student requirements (for example when the change to semesters was announced or when the MECH2000/3000 exams was instituted)

The most important mode of communication between the UGPO and undergraduate students is bulk mail through the "me-ug" mailing list. "Me-ug" is a highly moderated mail group to which all MECH students subscribe. The highly moderated nature ensures the UGPO is the only person allowed to post to the list, thereby ensuring that any mail received on this list is treated as important. This has proven to be a highly effective means of communication. Typical announcements include registration-related information on classes, job openings, internship offers, student recognitions, and honor/professional society information. Auburn University adopted email as the official means of communication with students so that students expect communication from the UGPO via email.

The Auburn University calendar switched from quarters to semesters in Fall 2000. That presented a rather tricky one-time challenge for the advising office. A packet of documents was prepared to guide students through this transition with every course sequence tabulated in a "before transition" and "after transition" format. Every enrolled Mechanical Engineering student was advised personally one-on-one and made to sign a "transition summary" sheet during Spring Semester 1999 to ensure smooth transition a year later. The transition process proved to be remarkably trouble-free due to this extensive preparation.

Another key measure implemented by the Department is the inclusion of the pre-requisite flowchart into the on-line registration software in OASIS. As the first engineering department to implement this, the ME Department takes a pro-active approach to ensuring that students always have the correct pre-requisites for any course they take. This flowchart is also used in hard-copy format to help students plan their path through the curriculum beginning in their sophomore year after they make the transition from their pre-Mechanical curriculum to the Mechanical curriculum.

Further, to help support an active involvement in the University's Co-operative Education Program, the ME Department offers every required course every semester (including summer semester). Although it might stretch our resources, we feel the flexibility it offers our students is well worth the trouble. Through active course management, the UGPO office anticipates and adjusts enrollment ceilings so student needs are met. Common adjustments include seeking larger classrooms or adding a laboratory section. Undergraduate students are also provided with a list of elective courses offered for the next two years to enable them to plan this important aspect of their senior year.

The UGPO Office strives to reach out to the entire spectrum of students by providing access to free tutoring services to students with academic difficulties, career counseling, job placement information, and departmental scholarship support for students who are excelling academically. One new program, implemented in 2002, is the "O'Neal Austin Best Student Award," given every semester to ten students identified by their instructors as having secured the highest cumulative score on the graded material in ten selected courses. Each of these students is presented with an AU Bookstore gift card and an award certificate at a luncheon organized in their honor. This program, unique among AU Departments, serves to motivate all the students in class to perform better.

The combination of the flowchart training, the me-ug mailing list and the offering of required courses every semester helps students make a smooth passage through the curriculum.

1.2 Policies for Transfer Students and Transfer Credit:

The Engineering Student Services (ESS) Office handles the process used to admit transfer students outside the department. That office operates a program called Successfully Orienting Students (SOS) during the summer semester to orient incoming transfer students. While basic science, English, and History credit is assessed entirely by the ESS Office, any transfer credit to be assigned for engineering courses, is done in consultation with the Mechanical Engineering Department's Undergraduate Program Officer (UGPO). Course evaluation is done using transcripts and detailed course outlines. Records of transferred courses are maintained in the ESS Office and on the on-line database, OASIS.

1.3 Administrative Support for the Undergraduate Program

The administrative and support services in the Department shown in Figure B1.1, Administrative and Support Services in the Department of Mechanical Engineering provide the infrastructure needed to maintain and support academic and research programs. A summary of support functions relevant to the undergraduate program is described below.

- **Mechanical Engineering Shop** – The Mechanical Engineering Shop is managed by Mr. Gary Roberts who has very complete knowledge and experience (more than 20 years) in all areas covered by the shop, namely machining, electronics, mechanics, and safety. Mr. Roberts reports to the Chair of Mechanical Engineering. Three permanent positions: Mr. Timothy Martin as a machinist, Mr. John Gardiner as an electronics engineer, and Mr. Dennis Thrasher (supported by soft funds and currently on military leave) as a CNC machinist are used to operate the shop. All of these people have over 20 years experience in their area of expertise. In addition to these permanent personnel typically three part-time students support the shop activities. Additionally, the College of Engineering provides a registered Professional Engineer, Mr. Hugh Fellows, to provide technical support for the College. Over 50% of his time is spent in support of shop activities with undergraduates. The shop is completely fitted with state-of-the-art machines and equipment. The major support provided to undergraduates by the shop is for the Capstone design sequence (MECH4240 and MECH4250). Every student is trained in a program on all aspects of machining. The training includes intensive safety presentations. The shop personnel oversee and provide technical support to approximately 100 students per year who perform the machine operations necessary to build and test their design. These activities include electronics, controls, etc. Another significant contribution of the shop is support of competitive, design/build extracurricular activities such as War Eagle Motorsports (Formula and Baja), Sol of Auburn (Solar Car), and Solar House. The shop also actively supports all laboratory courses.
- **Instructional Laboratories** – The Department has recently created a full time position to support undergraduate laboratories. The person hired in this position is Dr. A. Mishra. Dr. Mishra has a BS, MS, and PhD in Mechanical Engineering and has served for seven years at Auburn as an Adjunct Professor after retiring from IIT in New Delhi. He is responsible for ensuring the smooth operation of the laboratories. His duties include working with the faculty and teaching assistants assigned to the instructional laboratories; assisting the faculty in developing new experiments; and repairing, maintaining, and purchasing equipment. He also helps identify equipment needed in the laboratories.
- **Student Competition Center** – The Department has developed dedicated spaces for the design

machines and handling facilities. A suitable space has been provided, some cosmetic improvements have been made and some equipment purchased. The groups currently utilizing this space are War Eagle Motor Sports (Baja and Formula) and Sol of Auburn-solar-electric car. Dr. Peter Jones is the faculty advisor of War Eagle Motor Sports and Dr. Sushil Bhavnani is the Sol of Auburn advisor. The faculty and administration are supportive of these efforts and major renovation and additional staffing are planned for the center as funding permits.