8. Program Criteria

Program criteria for Mechanical Engineering that apply include categories of curriculum and faculty.

8.1 Curriculum

The program must demonstrate that graduates have

- Knowledge of chemistry and calculus-based physics with a depth in at least one
- The ability to apply advanced mathematics through multivariate calculus and differential equations
- Familiarity with statistics and linear algebra
- Ability to work professionally in both thermal and mechanical systems areas including design and realization of such systems.

The Mechanical Engineering curriculum is shown in (Table I-1, Appendix I.A). Table I-1 defines the relationship and number of hours devoted to Math and Basic Science (Program criteria 1, 2 and 3 as defined above), Engineering topics (EC Program criteria 4 as defined above) and General Education.

The following is a detailed description of the philosophy of the Mechanical Engineering Curriculum in preparing our students to meet the EC program criteria. The first two years of the program provide the basic preparation for the students to meet the program criteria. In this time period students take mathematics, Calculus (MATH 1610, 1620, 2630); Differential Equations (MATH 2650); and linear algebra (MATH 2660), science including Chemistry (CHEM 1030, 1031), Physics (1600, 1610), and Material Science (MATL 2100). These basis principles are applied and integrated into more practical applications in engineering science courses, Engineering Mechanics-Statics and Dynamics (MECH2110), Kinematics and Dynamics of Machines (MECH 2120), Thermodynamics (ENGR 2010), and Design (MECH 2120).

The junior level courses prepare the student for criteria 4 listed above. The Thermal System Courses include Thermodynamics (MECH 3020), Fluid Mechanics (MECH 3030), and Heat Transfer (MECH 3040). The Mechanical Systems courses include Mechanics of Materials (MECH 3130) System Dynamics and Controls (MECH 3140), and Machine Design (MECH 3230). Courses are also included to provide modern engineering tools to support the students’ ability to work professionally in the design and realization of mechanical and thermal systems. These courses include Computer Aided Engineering (MECH3220), and Measurement and Instrumentation (MECH 3050). Finally at the junior level basis courses in Electrical Engineering (ELEC 3810) and Economics (INSY 3600) are included to round out the student’s ability to meet criteria 4 as listed above.
At the senior level a two-semester comprehensive design sequence is offered to solidify the students’ ability to work professionally with both mechanical and thermal systems. These courses give the student real world experience in design methodology, working in multidisciplinary teams, hands-on manufacturing processes, and design improvements. In addition, three technical electives are included to allow the students to gain further specialized knowledge.

In addition to the technical courses described above, Auburn University requires an extensive core of 41 semester hours in English, Philosophy, Fine Arts, Mathematics, Science, History, and Social Science. The Department fully concurs with the philosophy established by the University in delivering a broad education. The core curriculum included in the Mechanical Engineering curriculum (Table I-1, Appendix I.A) provides our students with the foundation to work professionally and relate effectively with their constituents. These core courses are scheduled at the freshman and senior level.

8.2 Faculty

The Mechanical Engineering faculty has expertise in all areas of Mechanical Engineering required to provide a sound education that meets the Program criteria. This fact is demonstrated by the qualifications of the faculty as fully described in Section B5 and Table I.3 (Appendix I.A). To further define faculty expertise, Table B2.3 shows the specialization areas of the faculty. This table clearly demonstrates that all areas of a fundamental education in Mechanical Engineering are covered by the collective faculty expertise.