For graduation, students must obtain a grade of "C" or better in each mathematics course, each physics course, and each Mechanical Engineering core course. Students must obtain a 2.0 GPA in all Mechanical Engineering courses attempted.

The department maintains a flow-chart that lists all of the coursework required in the program which is reviewed with the student on a regular basis by the Undergraduate advisor. The students are required to meet with their advisor each semester before registration for classes. Failure to maintain satisfactory progress in the program will initiate review by the Department.

For students participating in the Cooperative Education Program, industry supervisors will evaluate students on content knowledge, communication skills, and critical thinking skills. Possible outcomes for a student who receives an unsatisfactory evaluation include repeating an industrial placement or portion of the placement, tutoring, additional coursework, or removal from the Cooperative Education Program with no credit given.

CONTENT KNOWLEDGE (Technical Skills, Research Skills) and CRITICAL THINKING (Analytical Skills): Students will formulate and analyze problems, and synthesize and develop appropriate solutions based on fundamental principles. Students will recognize and apply concepts, principles, and theories in mathematics (including differential and integral calculus, differential equations, and matrix theory); Physics; Chemistry; the core Mechanical Engineering courses (statics, dynamics, strength of materials, thermodynamics, fluid mechanics, heat transfer, machine design I and II, engineering materials, system dynamics, and applied thermal/fluid engineering); and Probability and Statistics.

In the required senior design sequence (EGN 4410 Engineering Design I and EGN 4411 Engineering Design II) teams of students will design, build and demonstrate a workable project to be evaluated by a team of three faculty appointed by the chair. The performance of the project will require the team to research their project in the technical literature and for the possibility of patent applications. The faculty evaluates the students for their technical, research and critical thinking skills using an evaluation instrument developed for this purpose. This is done for both courses in the design sequence. Students receiving an unsatisfactory evaluation

in EGN 4410 Engineering Design I will not be allowed to continue into EGN 4411 Engineering Design II and will be required to restart the sequence in a following semester.

COMMUNICATION (Written Communication, Oral Communication, Team/Collaborative Communication): Students will communicate effectively in writing, convey technical material through oral presentations and function effectively in multidisciplinary teams.

In EGN 1002 Fundamentals of Engineering (freshman level), students are required write reports, make oral presentations and function in teams to perform design projects which are evaluated by the faculty member in charge of the course. In the laboratory sequence (EML 3523C Experimental Methodology and EML 4730L Mechanical Engineering Laboratory) students work in teams to perform experiments and prepare individual technical reports. In EML 4541 Engineering Design Practice (junior level), students are also required to write reports, make oral presentations and function in teams. In the required senior design sequence (EGN 4410 Engineering Design I and EGN 4411 Engineering Design II) student teams will prepare a technical report documenting the performance of the design project. This project will be presented to a group of three supervising faculty and their class peers in an oral presentation. Evaluations of the written report and the oral presentation will be performed by the faculty. Each student is the design team will complete a Peer Evaluation Report evaluating the contribution of the other team members to the project using an evaluation instrument developed for this purpose.

CRITICAL THINKING (Analytical Skills, Creative Skills, Practical Skills): Students will:

- **Use modern engineering techniques, skills, and tools, including computer-based tools for analysis and design of mechanical components and systems.**
- **Identify, formulate and solve mechanical engineering problems**
- **Design and conduct engineering experiments including analysis and interpretation of data.**
- **Deliver engineering results that meet performance standards for cost, safety, and quality.**
- **Describe the ethical and professional responsibilities of the mechanical engineer.**
- **Make and defend ethical judgments in keeping with professional standards.**

In the required senior design sequence (EGN 4410 Engineering Design I and EGN 4411 Engineering Design II) student teams will perform design projects which will incorporate the above criteria. A team of three faculty will evaluate these Capstone Design Project reports and oral presentations to these criteria. In performing the evaluations, the faculty members use their professional judgment and an assessment instrument developed for this purpose to evaluate communication skills and critical thinking skills, with respect to both individual students and student teams. Students receiving an unsatisfactory evaluation in EGN 4410 Engineering Design I will not be allowed to continue into EGN 4411 Engineering Design II and will be required to restart the sequence in a following semester.

Approved 1-24-2006