1. Title of Course: MME 4419, Metallurgical and Materials Engineering Design.

2. Catalog Description: Metallurgical and Materials Engineering Design (3-3) Introduction to creative industrial problem-solving and the design process in materials engineering. Topics include material and process selection, project planning and resource management, economic decision making in terms of cost evaluation and profitability, and optimization methods. Weekly discussions explore issues of professionalism including engineering ethics, public safety and environmental concerns in design, codes, and standards, etc. Student design teams define and investigate problems in metallurgical processing, materials selection and evaluation, quality control, etc. Design project teams make written and oral progress reports, as well as a final written report and presentation. Laboratory time is devoted to design projects.

3. Prerequisites: Restricted to majors: MME. Prerequisites: MME 4303, with a grade of "D" or better, MME 3407, with a grade of "C" or better, and BE 2326, with a grade of "D" or better.

4. Textbook: No specific text is required. Handouts are provided by the instructor. Readings from a variety of sources are assigned. Reference books are also used.

5. Course Objectives: The course aims to introduce the students to creative industrial problem-solving and the design processes practiced in materials engineering.

6. Topics: Topics include material and process selection, project materials engineering, planning, resource management, professional ethics, standards and codes, environmental policies and implementation of total quality improvement in design practice.

7. Class Schedule: The course meets three times per week for 50 minutes per class.

8. Contribution to the professional component: This course is taught only to Metallurgical and Materials Engineering majors and contributes mostly to several important outcomes: A, via case studies, and outcome B.

9. Relationship to Program Objectives: Course enables students to see the practical application of fundamental concepts introduced in previous classes and assists development toward professional practice. Therefore this course contributes to educational objectives 1 and 2.