

1. MME 4419 Metal Materials Design & Pract.
2. 4 credits, 3 lecture hours and 3 lab hours per week
3. Shalayna Smith
4. No required text
5. Specific course information
  - 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.
  - Restricted to majors: MME, Prerequisites: MME 4303 with a grade of “D” or better, MME 3407 with a grade of “C” or better, and CE 2326, all with a grade of "C" or better
  - Required course
6. Specific goals for the course
  - Learning Outcomes
    - Design a component or solve an industrial problem.
    - Design and conduct experiments and interpret data that demonstrates technical competence in materials and metallurgical engineering.
    - Collaborate on a team in a meaningful and effective manner.
    - Report results in the form of an oral presentation and write a technical report.
  - Student outcomes addressed by the course.
    - Outcome 1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
    - Outcome 2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
    - Outcome 3: an ability to communicate effectively with a range of audiences
    - Outcome 4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

- Outcome 5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- Outcome 6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- Outcome 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7. Brief list of topics to be covered

- Engineering Design and Problem Solving
- Project Management – Cost and Scheduling
- Project Proposals and Reviews
- Engineering Ethics and Professional Engineers
- Technical Report Writing
- Technical Presentations
- Resumes and Interviewing