

MET 464: METALLURGICAL ENGINEERING DESIGN III

CATALOG DATA:

MET 464 – METALLURGICAL ENGINEERING DESIGN III; (0-2) Credits

Prerequisites: Senior standing or graduation within three semesters, MET 351, MET352

This course is the first semester of a two-course sequence in Interdisciplinary Senior Capstone Design Project (ISCDP) that involve both lecture and design practice sessions. The course integrates vertically and horizontally concepts from all areas of Metallurgical Engineering into a practical senior capstone design project design to train the students in the design practice. Fundamentals of the design process, specifications, decision-making, materials selection, materials process, experimental design, statistic process control and preliminary design are the focus. The major part of this course consists in the development of the senior capstone design project.

TEXTBOOK:

Textbook: ENGINEERING DESIGN, A Materials and Processing Approach, George E. Dieter, McGraw-Hill Company, Third Edition, 2000. (Not required)

INSTRUCTOR:

Dr. Stanley M Howard, Open Office Policy. Appointments available by request

EXPECTATIONS:

The course focuses on the development of Interdisciplinary Senior Capstone Design Projects (ISCDP) with vertical and horizontal integration of concepts from all areas of Metallurgical Engineering. The student is expected to put together the fundamental and applied knowledge acquired during the previous years of the engineering tenure. This means a comprehensive effort involving most of the components of real-world design projects. Specifically the student is expected to have a good working knowledge:

- Principles of product and process design
- Problem solving skills
- Analysis skills on materials microstructure/property relationships
- Communication skills, both oral and written

COURSE OBJECTIVES:

The objectives of this course are to provide hands on practical experience on Metallurgical Engineering Design. Students develop their projects by working in interdisciplinary teams under the direction and supervision of one or more Faculty mentors. During the development of the course the students will demonstrate acquire skills to:

- Assessment of need
- Proposal preparation
- Definition of design requirements
- Gather information
- Conceptualize various solutions
- Evaluation of design concepts and select a candidate design
- Work in an interdisciplinary team environment
- Communicate the design effectively by written reports and oral presentations

COURSE OUTCOMES:

During this course students will demonstrate the ability to:

- Define the problem and establish the project specifications and constrains
- Gather information and establish the state of the art on the design science and technology
- Conceptualize various concept solutions to the design problem
- Use decision matrices for the selection of the candidate solution
- Establish the candidate design and the matrix of tasks needed to achieve this design
- Establish a project schedule
- Work effectively in a team environment
- Write progress and final design reports
- Make effective oral presentations

FREEDOM IN LEARNING

Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should contact the dean of the college which offers the class to initiate a review of the evaluation.

ADA STATEMENT

Students with special needs or requiring special accommodations should contact the instructor, Dr. Howard at 394 1282 or the campus ADA coordinator at 394-2416 at the earliest opportunity.

GRADES

Grades are determined by the following schedule:

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| Weekly Progress Reports (emailed to Course Instructor and Project Director. Approx 10) | 200 points |
| Semi-semester Progress Reports (Written ~ 6-10 pages, and oral) | 40 points |
| <u>Semester Report (written and oral as required)</u> | <u>100 points</u> |
| Total | 340 Points |

No credit is given for late weekly reports. Half credit is given for late semi-semester and Final Reports

CLASS SCHEDULE:

MET 464 classes will meet with the Interdisciplinary Senior Capstone Design Project (ISCDP) coordinators as approved by the coordinators. A mid-term oral presentation and summary progress report and an end-term oral presentation a formal engineering style report is requested on each ISCDP.

TOPICS:

Interdisciplinary Senior Capstone Design Projects (ISCDPS)

COMPUTER USAGE:

As required by projects

RELATION OF COURSE OUTCOMES TO PROGRAM OUTCOMES: (c), (d), (e), (f), (g), (h)

LABORATORY:

As required by projects