

MACH 61A Course Outline as of Fall 2005**CATALOG INFORMATION**

Dept and Nbr: MACH 61A Title: FERROUS METALLURGY

Full Title: Ferrous Metallurgy

Last Reviewed: 12/12/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	2.00	17	Lab Scheduled	35.00
		Contact DHR	1.00		Contact DHR	17.50
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 39 - Total 2 Times

Also Listed As:

Formerly:

Catalog Description:

Study of ferrous metals including alloying, heat treating, testing and applications in industry.

Prerequisites/Corequisites:**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Study of ferrous metals including alloying, heat treating, testing and applications in industry. (Grade Only)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Total 2 Times

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:	
CSU GE:	Transfer Area		Effective:	Inactive:	
IGETC:	Transfer Area		Effective:	Inactive:	
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:	Fall 2018
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Students will:

- A. Be able to describe the basic properties of all ferrous metals.
- B. Be able to describe the process of mining, extraction and refining of ores to metals.
- C. Identify metals using the periodical table of elements based on weights and atomic numbers.
- D. Use handout materials, text and library materials to do research on metallurgical alloys.
- E. Perform basic lab experiments plotting data, measurements of metal density and volumes, for purposes of identifying metals.

Topics and Scope:

1. Introduction to Metallurgy
2. History of Elements
3. Iron and Steel Refining
4. Identifying Ferrous Metals
5. Tensile Test
6. Heat Treatments
7. Quenching Media
8. Hardness Testers
9. Physical/Chemical Metallurgy Grain Structure/Patterns/
Lattices
10. Iron/Steel Systems, A.I.S.I., S.A.E., U.S.S., A.W.S.
11. Density Measurements
12. Review/Final

Assignment:

The following is a list of assignments that will determine the final

grade for the students.

A. Homework: to consist of reading assignments in assigned text.

B. Lab work: laboratory assignment to be completed during the lab sessions.

C. Mid-term paper: as per instructions by instructor, consisting of library research.

D. Group project on a metallurgical process (refining, mining, extraction, or production) to be given orally in class.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Lab reports

Writing
20 - 25%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Lab reports

Problem solving
15 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations
0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion

Exams
55 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category
0 - 0%

Representative Textbooks and Materials:

METALLURGY, by B.J. Moniz, American Technical Publishers, 2nd Ed., 1994