SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 48.0501

SEMESTER: Departmental Syllabus

COURSE TITLE: Metallurgy

COURSE NUMBER: MACH0106

CREDIT HOURS: 1

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

PREREQUISITES: Fundamentals of Mathematics w/ a grade of "C" or higher or appropriate score on the Math assessment test.

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckcc.bookstore.com, for the required texts for your particular class.

COURSE DESCRIPTION:
Metallurgy Fundamentals is designed for those who desire to learn the basics of the Behavior of metals and provide them with a broadened range of the industrial knowledge of The entire field of metals (metallurgy) the course content will provide the student learner the Whys and how’s of the selection of metals for their particular applications. It will also cover physical conditions that working or deforming may have on metals in relationship to being machined.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. History of metal process.
A. Where metals come from  
B. Early and present smelting methods  
C. Production of metals  
D. Refining of steel process  

II. Steel Production:  
A. Production of ferrous and non ferrous material  
B. Shaping and forming metals  
C. Welding metallurgy  
D. Power metallurgy  
E. Surface treatments  
F. SAE numbering system  
G. Alloying  
H. Bearing materials  

III. Testing materials:  
A. Identify testing  
B. Identify hardness  
C. Identify strength  

IV. Heat treatment:  
A. Heat ranges  
B. Heat sensing methods  
C. Oven operations  
D. Precautions and safety  

EXPECTED LEARNER OUTCOMES:  
A. The student will be able to understand the history of steel making process.  
B. The student will be able to identify metals by various methods.  
C. The student will be able to understand non destructive vs destructive testing.  
D. The student will be able to perform applications related to metallurgy.  
E. The student will be able to operate heat treating ovens.  
F. The student will be able to test hardness by various methods  
G. The student will be able to understand annealing.  

COURSE COMPETENCIES:  
Upon completion of this course:  

*The student will be able to understand the history of steel making process.*  
1. The student will be able to describe the history of iron and steel.  
2. The student will be able to summarize the production of iron and steel.  

*The student will be able to identify metals by various methods.*  
3. The student will be able to identify ferrous and non ferrous metals.  
4. The student will be able to define refining of steel.  
5. The student will be able to differentiate alloys and special steel.  
6. The student will be able to identify tool steels and their uses.
The student will be able to understand non destructive vs destructive testing.

7. The student will be able to performs safety precautions related to testing.
8. The student will be able to give examples of destructive testing.
9. The student will be able to perform non destructive test.

The student will be able to perform applications related to Metallurgy.

10. The student will be able to describe shaping of steel.
11. The student will be able to give examples of Powder Metallurgy.
12. The student will be able to identify materials by utilizing the SAE # system.
13. The student will be able to give examples of effects of welding metals.

The student will be able to operate heat treating ovens.

14. The student will be able to identify heat treating.
15. The student will be able to locate heat treatment harding tempters.
16. The student will be able to identify temperatures for heat treating materials.
17. The student will be able to identify quenching methods.
18. The student will be able to identify parts of heat treating equipment.
19. The student will be able to energize heat treating oven to specifications.

The student will be able to test hardness by various methods

20. The student will be able to test metals for hardness range.
21. The student will identify hardness tester.
22. The student will identify hardness testing methods.

The student will be able to understand annealing.

23. The student will be able to perform annealing process.
24. The student will be able to perform tempering or normalizing process.
25. The student will be able to perform case harding process.
26. The student will be able to record maintenance performed on equipment.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff.
that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the director of the Academic Resource Center, in Rm. 3354 or call at: 288-7670.