NORTHEASTERN TECHNICAL COLLEGE
COURSE OUTLINE

COURSE: PREFIX NO.	EFFECTIVE DATE	NEXT REVIEW DATE
MTT 141	SPRING 2007	SPRING 2008

TITLE:	CREDITS	CONTACTS
		CLASS - LAB - TOTAL
METALS AND HEAT TREATMENT	3	3 0 3

PREREQUISITES: None

DESCRIPTION:

LEVEL I: This course is a study of the properties, characteristics, and heat treatment procedures of metals.

LEVEL II: In this course, the student will gain a working knowledge of the properties, characteristics, and the machinability of the metals common to the machinist trade. The ability to read charts and interpret the steel manufacturer's recommendation for heat treatment is covered.

TEXTBOOK(S) OR ALTERNATIVE:

Metallurgy Fundamentals, Daniel A. Brandt

MATERIALS (specifying those to be purchased by student):

Safety glasses

COLLATERAL READING:

Machine Shop Operations and Setups

Machine Tool Practices, 5th Ed. Kibbe, Neely, Meyer, White

CLASS MANAGEMENT ACTIVITIES (Attendance, tardies, testing, etc.):

Academic Dishonesty: Students are expected to do their own work. Please refer to the NETC Student Code and Grievance Procedure for a definition of academic dishonesty and an outline of the disciplinary action that may result therefrom.

Attendance and tardies: The student must attend 90% of classes. The student will be dropped from the course for excessive absences. Three tardies constitutes one absence.

Testing: Weekly tests and pop quizzes will be given at instructor’s discretion. A term paper will be required. A final exam will be given. Students will be responsible for work assigned while absent from class. Make-up tests will only be given with prior arrangements being made with instructor or at instructor’s discretion.

Student ID: It is mandatory that every student wear his or her student ID at all times on the Cheraw campus. During the first week of classes, the instructor will issue a reminder to wear the ID. This reminder is a warning.

After the first week of classes, instructors are required to dismiss students without ID from class. The student may get his/her ID (or a new one in Student Services for $3.00) and return to class before the midpoint of the class. If the student cannot get an ID and return to class by midpoint, the instructor will record the absence.

DISABILITIES STATEMENT:

Students with disabilities are encouraged to contact the Vice President for Student Services to discuss needs or concerns as they pursue an academic program and participate in campus life. The Vice President for Student Services will provide guidance regarding official documentation of disabilities and/or accommodation of needs. (See College Catalog)

RESOURCES (A-V, persons, tools/equipment):

COURSE TOPICAL OUTLINE (List topics and sub-topics of course) and Calendar or approximate length of time devoted to topic.

WEEK 1: The history of iron and steel.
Practical applications of metallurgy.
Chemical terms.

WEEK 2: Steel and the steel making processes.

WEEK 3: Steel and the steel making processes.

WEEK 4: Properties of metals.

WEEK 5: Properties of metals.

WEEK 6: Alloys and the effects of alloys.

WEEK 7: The testing of steels.

WEEK 8: The crystal structure of steels.

WEEK 9: Failure and deformation.

WEEK 10: Reading diagrams.

WEEK 11: Heat treating steel.

WEEK 12: Heat treating steel.

WEEK 13: Surface treatment commonly applied to metals.

WEEK 14: Classification of steels.

WEEK 15: Review.

OBJECTIVES OF COURSE: Upon successful completion of this course:

1. The student will demonstrate knowledge of the history of iron and steel.
2. The student will demonstrate knowledge of the production processes used to produce iron and steel.
3. The student will demonstrate knowledge of the processes and equipment used in the refining into steel.
4. The student will demonstrate knowledge of the processes and equipment used in the shaping and forming of metals.
5. The student will demonstrate knowledge of the mechanical properties of metals.
6. The student will demonstrate knowledge of the selection of carbon steels by type and mechanical properties.
7. The student will demonstrate knowledge of testing material properties and use of test equipment.
8. The student will demonstrate by practical application the ability to test steel for hardness (by Rockwell hardness tester and file test), carbon content (by spark testing) and toughness, along with grain size (by fracture test).
9. The student will demonstrate knowledge of the heat treatment of steel.
10. The student will demonstrate knowledge of alloying elements and the effects alloys have on steel. This will include the ability to read alloy diagrams.
11. The student will demonstrate knowledge and practical application of the surface treatments commonly applied to metals.
12. The student will demonstrate knowledge of the classification of steels.

INSTRUCTIONAL METHODS TO COMPLETE OBJECTIVES:

Term Paper
Classroom Lecture
Homework Assignments

EVALUATIVE METHODS TO APPRAISE OBJECTIVES:

Exam -	25%
Quizzes -	10%
Term Paper -	25%
Written Tests -	40%

If no quizzes are given written tests will count 50%.

GRADING:

93 – 100	=	A
85 - 92	=	B
77 - 84	=	C
69 - 76	=	D
BELOW 69	=	F

REQUIREMENT FOR TERM PAPER:

1. Seven (7) complete pages of written information double-spaced, one (1)-inch margins, top, bottom, and sides. (MLA Format) Topic will be determined upon assignment.

2. Title Page.

3. Table of Contents Page

4. Letter of transmittal Page.

5. Bibliography Page.

6. Three (3) sources (not including Course Text Book). Only **one** (1) Internet source will be accepted.

7. All papers should be in correct order and placed in a plastic folder.