

COURSE INFORMATION

COURSE PREFIX/NO: **MTT 141**
COURSE TITLE: **Metals and Heat Treatment**
LEC HTS/WEEK: 3.0
LAB HRS/WEEK: 0.0
CREDIT HRS/SEMESTER: 3.0

DL ATTENDANCE/VA STATEMENT TEXTBOOK INFORMATION

COURSE DESCRIPTION

This course is a study of the properties, characteristics, and heat treatment procedures of metal.

COURSE COMPETENCIES

Upon successful completion of this course, the student will perform the following:

- describe properties of metals
- describe different manufacturing processes for steel making
- identify types of furnaces used to heat treat metals
- use correct heat treatment terminology
- select correct steel type by color and number
- test for changes that take place in carbon steel while being heat treated.
- identify non-ferrous metals

MINIMAL STANDARDS/PERFORMANCE OBJECTIVES

Given classroom lectures and demonstrations, the student must describe 70% of the physical properties of metals.

Given classroom lectures and demonstrations, the student must name and describe three of the four methods for making steel.

Given lectures and demonstrations, the student must identify and use correctly four of the six furnaces used in the heat treatment of metals.

Given lectures on common terms in the heat treatment of steel, the student must identify 70% of these terms.

Given lectures and a handbook on steels, the student must select the proper steel for the job with 100% accuracy.

Given lectures, color and steel charts, the student must identify steel according to color and number with 100% accuracy.

Given lectures and demonstrations, the student must check with 100% accuracy for the changes that take place in steel due to heat applications.

Given lectures and demonstrations, the student must perform the process to harden the outer surface of a piece of low carbon steel to instructor's specific criteria.

Given lectures and demonstrations, the student must identify three out of four non-ferrous metals.

COURSE REQUIREMENTS

ATTENDANCE

The student should adhere to the attendance policy set forth in the York Technical College Student Handbook. "Students must attend 80% of the hours assigned the class for a semester to receive credit for the course. In case a student does miss a class he/she is responsible for obtaining the material that was covered during the absence.

If a student is aware that he/she will miss class, then the student should notify the instructor at the earliest possible date.

If a student misses a test because of illness or urgent emergency, then he/she should do the following:

Notify the instructor prior to the class period, or at the earliest possible date. At that time a new date for a make-up test will be scheduled.

Student with unexcused absences during test time will be allowed to take a make-up test at the instructor's discretion.

The student has the burden of making sure that some arrangement was made with the instructor to take a make-up test.

ACADEMIC HONESTY

"York Technical College adheres to the South Carolina TECH Student Code, approved by the State Board for Technical and Comprehensive Education on March 13, 1974 (revised last April 25, 1984). Copies of this code are available in the Library and from Student Services. Any student caught cheating or involved in any other academic dishonesty will be given a grade of zero and will be subject to further disciplinary action".

PARTICIPATION IN CLASS DISCUSSION

COMPLETING ASSIGNED READING, LAB DEMONSTRATIONS, AND TESTS

CLASSROOM AND SHOP PROCEDURES

- Roll will be called at the beginning of each class.
- Students are responsible for assigned reading on steel and its alloys and heat treating.
- Tools and equipment that are used will be returned to their proper place.
- At the end of each class the student will be responsible for cleaning his/her work area. Brushes, brooms, and mops will be provided for this purpose.
- Shoes and safety glass must be provided by the student.

LAB REQUIREMENTS

During the lab, students may work in pairs or individually. The instructor must see the completed project. A performance test will be given to ascertain if the student can successfully make the project.

EVALUATION STRATEGIES/GRADING

Students will be expected to complete two written tests, four lab projects/reports and assigned homework questions. Minimum score of 70% will be required on each test, project, reports and homework. Students who score below 70% may request a retest, at instructor's discretion. Maximum retest score will be 80%.

The final grade for MTT 141 will be determined as follows:

Lab projects:	60%
Test projects:	30%
Homework/Q&A:	10%

Grading scale is as follows:

A = 90-100
B = 80- 89
C = 70- 79
D = 60- 69
F = 0- 59

CRITERIA FOR LAB PROJECTS

A = Student completes all procedures correctly, without assistance.
B = Student completes all procedures correctly, with minimal assistance from instructor.
C = Student completes all procedures, with constant assistance from instructor.
D = Student does not complete all procedures, with or without assistance.
F = Student does not attempt to complete procedures, with or without assistance.

REQUIREMENTS FOR LABORATORY REPORT INCLUDE:

1. A standard size sheet of white paper must be used for the cover sheet. Your name, course number, and quarter must be on cover sheet.
2. Lab procedures and results must be listed as they are performed.
3. The lab report must be neat and written in correct English.

ENTRY LEVEL SKILLS

The student should possess the basic skills of reading, writing and arithmetic.

PREREQUISITES: None

CO-REQUISITES: None

TOPIC/CONTENT OUTLINE

- A. Physical Properties of Metals
- B. Manufacturing Process for Making Steel
- C. Type of Furnaces Used to Heat Treat Steel
- D. Terms Used in Heat Treatment Terminology
- E. Selection of Tool Steel
- F. Classify Steel by Color or Number
- G. Heat Treatment of Steel
- H. Case Hardening
- I. Non-ferrous Metals

METHODS OF INSTRUCTION

Classroom instruction will include lectures and discussions. Alternate instructions: If extra help is desired by the student, he/she should:

1. Ask the instructor for additional help in the shop.
2. Review units in the textbook.

