

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: ETI 2425

COURSE TITLE: Metallurgy

PREREQUISITE(S): None

COREQUISITE(S): None

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 3

CONTACT HOUR BREAKDOWN:

 Lecture/Discussion: 3

 Laboratory:

 Other:

FACULTY WORKLOAD POINTS: 3

STANDARDIZED CLASS SIZE ALLOCATION: 30

CATALOG COURSE DESCRIPTION:

This course focuses on the fundamental principles associated with the metallurgy of steel. Students in this course will develop an in-depth understanding of the thermal, physical and chemical properties of steel as it relates to melting, casting and rolling in a modern Electric Arc Furnace (EAF) mini-mill process. Enrollment in this course is restricted to AmeriSteel Corporation employees only.

SUGGESTED TEXT(S): The Making Shaping and Treating of Steel, 10th Edition,
Published by AISE

IMPLEMENTATION DATE: Fall Term, 2000

REVIEW OR MODIFICATION DATE: Fall Term, 2002 (20031)
Fall Term, 2006 (20071) (was ETI 2158)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction	1
A. History	
B. Course Outline	
II. Principles of Heat Treatment of Steel	14
A. Metallography	
B. Hardenability	
C. Heat - Treatment Procedures	
D. Heat - Treating Furnaces	
E. Thermomechanical Treatment	
F. Lab	
III. Mechanical Testing	12
A. Introduction	
B. The Tension Test	
C. Hardness Testing	
D. Fatigue Testing	
E. Fracture Toughness Tests	
F. Fracture Mechanics and Fracture Control	
G. High - Temperature Tension, Creep, and Rupture Testing	
H. Miscellaneous Mechanical Tests	
I. Lab	
IV. Electric - Furnace Steelmaking	6
A. Metallurgical Processes in Three - Phase Direct - Arc Electric Furnaces	
B. Steel Solidification	
V. Physical Chemistry of Iron and Steelmaking	12
A. Thermochemistry and Fundamentals	
B. Properties of Metallurgical Systems	
C. Steelmaking Reactions	
D. Ladle Treatment of Steel	
E. Inclusions in Steel	
F. Lab	

PROGRAM TITLE: Industrial Management Technology (Steel Mill)

COURSE TITLE: Metallurgy

CIP NUMBER:

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLE(S):

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE - - The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

11.02 Draw conclusions or make inferences from data.

18.0 DEMONSTRATE AN UNDERSTANDING OF TECHNICAL OR INDUSTRIAL COMPETENCIES - - The student will be able to:

18.01 Demonstrate an understanding of technical or industrial competencies as specified in the curriculum frameworks of any post-secondary adult or post-secondary vocational program.