MESABI RANGE COMMUNITY & TECHNICAL COLLEGE

Course Outline

Course Title:	Introduction to Materials, Processes, and Production	**Submitted By:**	**Keith Mattson**
Semester Course Prefix and Number:	**IT 2220**	**Approval Date:**	**April 2009**
Old Quarter Course Prefix and Number:		**Revision Date:**	

Number of Credits: **3** **Number of Lecture Credits:** **2**

Semester(s) Offered: **Number of Lab Credits: 1** **Number of Lab Hours: 2**

Class Size: 35 lect., 24 lab **Number of Studio/Demonstration/Internship Credits: 0**

Negotiated by AASC on (date)_____

Course Purpose Code:

_____ **0 –** Developmental Courses
_____ **1 –** Non-transferable, General Education
__X__ **2 –** Technical course related to career programs
_____ **3 –** College course which has the primary goal of applying certain concepts (e.g. vocal ensemble)
_____ **4 –** Other college course not considered a part of general education (MNTC) (e.g. computer science, health, physical education)
_____ **5 –** Course which is intended to fulfill the Minnesota Transfer Curriculum (MNTC) requirements or intended for transfer.
_____ **9 –** Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

Catalog Description:

This course provides an introduction to materials, processing, and manufacturing methods used to produce various products. The course introduces basic fundamentals of materials, and manufacturing processes used to produce, shape, form, and join them. Methods used to select, analyze, and evaluate materials will be introduced and applied in a laboratory setting. Finally, principles related to large-scale manufacturing and automation will be investigated. This includes analysis and selection of manufacturing strategies, production planning and scheduling, plant layout, automation equipment, and cost constraints.

Prerequisites and/or recommended entry skills/knowledge:

Course Prerequisite(s):	IMRT 1215 or equivalent, or consent of instructor.
Reading Prerequisite:	None
Composition Prerequisite:	None
Mathematics Prerequisite:	Math 094 or equivalent

Career Programs and Transfer Majors Accessing this Course:

Industrial Technology – mining emphasis, EIAT, pre-science, pre-engineering, and mathematics students.

Minnesota Transfer Curriculum Goal(s) partially met by this course if applicable:

(Notes: No more than two goals may be met by any one course. Curriculum Committee review and the Chief Academic Officer's approval are required.)

0. __X__ None
1. _____ Communications
6. _____ The Humanities and Fine Arts
7. Human Diversity

2. ____ Critical Thinking
3. ____ Natural Sciences
4. ____ Mathematical/Logical Reasoning
5. ____ History and the Social and Behavioral Sciences
8. ____ Global Perspectives
9. ____ Ethical and Civic Responsibility
10. ____ People and the Environment

Learning Outcomes: (including any relevant competencies listed in the Minnesota Transfer Curriculum)

Upon completion of this course, the student will be able to:

- Recite metallurgical and material properties of common materials used in manufacturing including metals, polymers, ceramics, and composites
- Describe methods for manufacturing and forming various materials
- Analyze components utilizing the principles of mechanics and stress analysis
- Recite the basic principles of testing, test procedures, destructive, and non-destructive testing
- Identify failure modes and the root causes of failures
- Compare the advantages, operating principles, and capabilities of various types of manufacturing processes and systems
- Build parts, components, or systems utilizing several manufacturing processes
- Analyze production costs, develop schedules, and construct resource plans for a manufacturing process
- Recite the trends in advanced and automated manufacturing and production systems.
- Utilize a PLC trainer to implement a simple automation process
- Recite the steps to set up manufacturing systems on a large scale to produce goods.

Student Assessment Methods:

Various informal and formal assessment methods, lab assignments, worksheets, exams, group projects, written reports and analyses. A formal written critical reflection will be required following each site visit.

Use of Instructional Technology: (includes software, interactive video and other instructional technologies):

- Videos, software, computer/software-based lab simulators and industrial controllers

Outline or Statement of Major Course Content:

- Course content will support the learning outcomes and instructional goals listed above
- Concepts learned and analyzed in lecture will be demonstrated and expanded in lab.

Additional Special Information: (special fees, directives on hazardous materials, etc.)

Transfer Information: (Please list colleges/majors that accept this course in transfer.)

Approvals:

Body	Representative Signatures	Date
Curriculum Committee		
Faculty Association		
Academic Affairs Standards Committee		
Chief Academic Officer		

Distribution: Original – Administrative Office
Copies: Curriculum Committee Chair, AASC Chair, Transfer Specialist, Originating Faculty Member, Scheduler, Records, Student Services, Learning Center, Library
Revised: October 2006