SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Precision Machining & Automation Technology Program
Revision Date: August 26, 2019
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	MACH1121
Course Title:	Machining Fundamentals
Prerequisite(s):	None
Catalog Description:	Theory and safe operation of machine and hand tools. Covers metrology, five basic machining techniques (drilling, turning, boring, milling, and grinding), tool geometry, speeds, feeds, and cutting fluids.
Credit Hours:	2.0
Class Hours:	23
Lab Hours:	23
Total Contact Hours:	46

II. COURSE OBJECTIVES: *Course will:*

A. Discuss the types of machine shops and different careers available.
B. Instill the importance and need for safety.
C. Demonstrate the proper use and care of precision tools, hand tools, and machine tools.
D. Teach the application of linear and angular measurement.
E. Recommend proper calculations of cutter speeds and feeds.
F. Explain screw thread terminology.
G. Review theory of nontraditional machining processes and manufacturing systems.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
- **1.** Identify careers and types of shops.
- **2.** Understand proper safety techniques and identify safety signage.
- **3.** Read and understand proper use and care of precision tools.
- **4.** Identify tool angles and grinding procedures.
- **5.** Identify cutoff and contour sawing machines.
- **6.** Identify drill bit features and drilling processes.
- **7.** Identify vertical milling machine features and milling processes.
- **8.** Identify features of a lathe and turning and boring processes.
- **9.** Identify threads and thread terminology.
- **10.** Understand basic Numerical control (NC, CNC, DNC) concepts.
- **11.** Understand nontraditional machining techniques.

B. General Education Learning Outcomes (GELOs)
- **1.** GELO 3: Critical Thinking & Problem Solving
  Outcome 2: Synthesize information to arrive at reasoned solutions to problems.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information)*

A. Unit 1
- **1.** History, Work Skills, Safety
- **2.** Hand Tools
- **3.** Measurement
- **4.** Sawing, Band Machining, Cutting Fluids

5. Layout
6. Drills & Drilling Machines

B. Unit II
1. Milling Machine & Milling Machine Operations
2. Precision Grinding
3. Jigs & Fixtures

C. Unit III
1. Lathe & Lathe Operations
2. Tapers
3. Fasteners and Threading

D. Unit IV
1. Introduction to CNC
2. Electromachining
3. Nontraditional Machining Processes

V. INSTRUCTIONAL MATERIALS

A. Required Text(s): Walker, John R., and Dixon, Bob, *Manufacturing Fundamentals*, 10th Edition, ISBN: 978-1-63563-208-8 and Walker, John R., and Dixon, Bob, *Manufacturing Fundamentals Workbook*, 10th Edition, ISBN: 978-1-63563-210-1

B. Other Resources: Notebook, Calculator

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:
1. Lecture
2. Small and large group discussion
3. Video presentation
4. On-line aids
5. Demonstrations
6. Handouts
7. Observations
8. Assigned lab projects
9. Field trips

VII. METHODS OF EVALUATION

A. Methods of evaluations, although determined by the individual instructor, traditionally includes a combination of the following:
1. Workbook
2. Quizzes
3. Tests
4. Participation/class conduct

VIII. SPECIFIC COURSE REQUIREMENTS

A. Completion of all tests, projects, and assignments within the time allotted.

B. Program shop safety rules will be followed. Please see the course outline for any additional safety rules established by the instructor.