

Student Name _____ Instructor Name _____

High School or Vocational Center _____ Grade _____

COMPETENCY CHECKLIST
Muskegon Community College
Materials Technology

Please check below each skill the student has mastered as described, with 80 percent accuracy, or with an A or B grade. The skills needed for articulation of each course are listed.

MET 101
Industrial Materials
3 Credit Hours

Task	Satisfactory	Unsatisfactory
PROPERTIES OF MATERIALS - The student will demonstrate an understanding of:		
Physical, mechanical, chemical, thermal, electrical, magnetic, optical, and acoustical properties of materials		
Tensile, yield, compressive, fatigue, impact, flow-creep, ductility, and hardness strengths of materials		
Coefficient of expansion, coefficient of thermal conductivity, specific heat, conductivity, resistivity, corrosion, and optical properties of materials		
The "scientific method" for arriving at solutions and understand how this applies in materials science		
The accepted theory of the structure of matter		
How the properties of matter are utilized in the manufacture, repair, servicing, and operations of products manufactured		
The basic properties of solids		
METALS – The student will demonstrate an understanding of:		
The sources of materials		
The production of metals		
The classification of iron and steel		
The heat treatments used with metals		
The function of alloys used in steel		
Ferrous, ferrous alloys, non-ferrous, and non-ferrous alloys		
Tensile strength, creep strength, and hardness testing of metals		
WOODS – The student will demonstrate an understanding of:		

Task	Satisfactory	Unsatisfactory
The 15 types of timber used in construction		
The classification of trees		
The difference between hardwoods and softwoods		
The structure of wood		
The physical characteristics of wood		
The defects in lumber		
The mechanical properties of lumber		
The elastic properties of lumber		
The moisture properties of wood		
Laminates, plywood and sandwich fabrication of woods		
CONCRETE – The student will demonstrate an understanding of:		
The difference between portland cement, aluminous cement, white-portland cement, masonry cement, and air-entraining portland cement		
The different aggregates used in concrete		
The moisture curing process used in concrete		
The relationship of tensile strength to compression strength in concrete		
The purpose and proper placement of reinforcing wood rods used with concrete		
CERAMICS – The student will demonstrate an understanding of:		
The nature of ceramics including porosity, density, structure, bonding, fracture toughness and thermal shock resistance		
Ceramic processing including chemical processing, melt processing, single-crystal processing, vapor processing, and finishing		
PLASTICS – The student will demonstrate an understanding of:		
The nature of polymers including polymer chain lengths, crystalline structures and network structures		
The properties of plastics including mechanical, thermal, chemical, optical, and electrical		
How plastics are made		
The types of plastics including thermoplastics and thermosets		
How plastics are used by society		
How plastics are recyclable		
How plastics are identified by testing and recycling identification numbers and symbols		

Task	Satisfactory	Unsatisfactory
The different manufacturing processes including vinyl dipping, injection molding, rotational molding, thermoforming, blow molding and compression molding		
COMPOSITES – The student will demonstrate an understanding of:		
The constituents of fiber-reinforced composites including fiber, matrix and fiber/matrix consolidation		
The reinforcing fibers including glass, boron, carbon-graphite, ceramic, and high-performance manufactured polymeric fibers		
The fiber properties including fiber strength, specific tensile strength, fiber loading, and fiber orientation		
The types of composites including polymeric matrix fiber, sandwich, flake, filled, laminar, and hybrid		
The fabrication of composites including contact molding, matched metal die molding, injection molding, resin transfer molding, and filament winding		

Instructor's Signature _____ Date _____