CORE COMPETENCIES POCKET REFERENCE

MATERIALS TECHNOLOGY AND MANUFACTURING

www.materialseducation.org
Introduction

The National Resource Center for Materials Technology Education partners with business, education, government, professional organizations, and the community to provide curriculum resources in materials technology to strengthen the engineering and advanced manufacturing workforce.
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• A cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation.

• **Competence** indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations.
The National Resource Center for Materials Technology Education (MatEdU) has collaborated with numerous National Science Foundation Advanced Technological Education funded centers and projects, professional organizations and industry subject matter experts to produce the core competencies found in this booklet.

Delineating core competencies assists educators in determining subjects that the technology student needs to attain the required proficiencies.

These are condensed versions in this booklet, but you can find the full versions on our website at

www.materialseducation.org/educators/core-competencies/
Common Core Competencies

Each of these five categories listed below and their competencies are common among all of the technician competencies in this guide.

Basic Competencies

- Demonstrate effective communication skills
- Prepare tests and analyze data
- Demonstrate workplace performance methods
- Demonstrate general technical competence

Measurement and Basic Technical Skills

- Carry out measurements of dimensions and of physical phenomena
- Interpret technical drawings
- Demonstrate laboratory skills

Mathematics, Calculations, and Data Systems

- Apply basic mathematic fundamentals
- Demonstrate proper use of units and conversions
- Apply geometry and trigonometric functions
Computer Skills
- Practice appropriate computer skills and uses
- Demonstrate use of computer applications
- Apply technical software to practice

Teamwork, Professionalism, Globalism, and Multicultural Skills
- Demonstrate effective work with teams
- Determine and develop effective project interactions
- Show personal professionalism
- Demonstrate cultural awareness in the workplace
- Recognize where a global perspective should be used in the workplace
Core Competencies

Manufacturing Technology Advisory Group

www.mtag-wa.org
Group Dynamics and Communication

- Principles and skills of good teamwork
- Responsibilities of the employee to the employer
- Responsibilities of the employer to the employee
- Characters of good speaking skills, listening, and use of clarification
- Use of or the application of problem solving techniques
- Distinguish the roles and responsibilities of the team member and the team leader
- The use of electronic communications in linking manufacturing processes
- Awareness to logically and efficiently written manufacturing instructions

Measurement

- Awareness to the different areas and things which can be measured in the manufacturing process such as: specifications, safety, estimates, statistical analysis, product dimensions
- Selection and use of appropriate measurement instruments and techniques.
- Understanding the importance of calibrated measurement equipment and verification and use of the certification date
- Steps necessary to ensure complete and accurate measurements
Safety and Health

- Assume responsibility for the personal safety of self and others
- Understand and comply with the safety requirements of the work area
- Awareness to manufacturer’s safety procedures and shop’s safety procedures used to operate equipment
- Know the location of and the proper use of personal protective equipment
- Understand the use and interpretation of SDS sheets (nee MSDS)
- Identification and classification of hazardous waste and proper collection methods
- Characteristics and potential impact of ergonomics on design, productivity and safety

Quality Assurance

- Awareness of “Quality In” (Quality at the source) vs. other methods of Quality Control
- Effects of quality on cost and profit
- Evaluation of data to monitor processes to customer satisfaction
- Observation of the use of established methods, plans, and procedures to maintain quality

Print Interpretation

- Identification and use of blueprint notes and dimensions to determine sizes, materials, and other requirements
- Identification and use of different types of dimensioning: reference dimensions, I.D./O.D., chamfers, hole patterns, size dimensions
- Identification and use of different line types within a drawing: hidden/invisible, center lines, datum lines, cut view lines, dimension lines
**Shop Skills**

- Observation of the use and application of basic shop math
- Use of basic geometric concepts such as:
  - straightness parallel, perpendicular, angularity, and concentricity
- Observed use of fundamental shop skills, the use of hand tools:
  - hammers, punch, hack saw, scribe, and screw drivers
- Electrical: desolder bulb and solder wick
- Power tools: sabersaw, skill saw, drill motors, soldering gun, welding, and cutting tools
- Use and application of machine tool skills: lathes, milling machines, grinders, drills, boring mills, and electrical discharge machines
- Understanding of how tooling and fixture are used in manufacturing
- Identification and procedures to form, cut, finish, fasten, and repair

**Business Economics**

- Identify opportunities for profit in manufacturing processes
- Changes in material, improved process, automation, and improved quality
- Identification of strategies that may maximize profit in manufacturing processes
- Observed applications of design-build teams, quality improvements, pride in workmanship, and increased skills of workforce
- Identification of procedures, which may increase loss in manufacturing processes: rework, safety problems, equipment problems, people (poor morale, lack of training, and not understanding the system)
- Awareness of the impact of customer satisfaction: quality, cost, delivery, safety, and morale
- How the value added concept is applied to each step of the process
- Factors considered in make/buy decisions

**Resource Management and Manufacturing**

**Computing**
- Understanding how and where are computers are used in manufacturing
- Understanding how production rates are determined
- Understanding inventory control, material forecasting and capacity planning as components of a manufacturing plan
- The manufacturing use and applications of different types of software, word processing, spreadsheets, databases, statistical, and graphic applications
- Understanding the use and application of a master schedule for manufacturing processes

**Product and Process Control**
- Know and understand the different process control applications
- Interpret statistical forecasting systems
- Examine and understand the advantages to “Just in Time” inventory control
- Understand factors that affect work in progress
- Understand the responsibility of designers, engineers, and technicians and their roles in product development
- General elements in process planning
Labor and Industry

- Understand the different roles of labor and management
- Awareness to social and manufacturing changes and employee needs
- Awareness to the duties of a union shop steward
- Identification of employee issues and related section of negotiated contract
- Awareness to the responsibilities of a union member
- Identification of the purpose and role of present day unions
Core Competencies

Materials Science Technician
www.materialseducation.org
**Chemical Science Skills**

- Apply safe and environmentally appropriate methods to chemical handling
- Demonstrate knowledge of chemistry fundamentals
- Describe atomic and nuclear structure and radioactive decay

**Physical Science Skills**

- Apply basic concepts of mechanics
- Apply concepts of fluids, heat, and thermal conduction
- Describe and apply concepts of electricity and magnetism
- Apply concepts of light and sound

**Fundamentals of Materials Science and Technology**

- Identify the general nature of metals
- Discuss the general nature of plastics
- Describe the general nature of composite materials
- Identify the general nature of semiconductors and optical materials
- Describe the general nature and behavior of ceramics and glasses
- Identify the general nature and properties of other materials used in engineering
- Define stress and strength
- Define strain and deformation
- Explain causes for differing materials properties
- Describe the general nature and behavior of emerging materials technologies
- Demonstrate how materials properties are used in engineering design
- Compare thermal, physical, and other properties of materials
Materials Testing

- Demonstrate the planning and execution of materials experiments
- Apply mechanical testing processes to solid materials
- Perform visual and nondestructive testing methods for solids
- Demonstrate knowledge of standards applied to materials
- Perform appropriate tests of metallic materials
- Perform appropriate tests of plastics and composites
- Perform appropriate tests of wood and concrete
- Perform appropriate tests of liquids

Materials and Processing – Metals

- Define and describe constituents, properties, and processing of steel
- Define and describe types and properties of cast iron
- Identify types, properties, and processing of aluminum and its alloys
- Discuss types and advantages of copper and its alloys
- Explain common uses for zinc and its alloys
- Identify properties and uses for magnesium and its alloys
- Discuss advantages of nickel alloys and their uses
- Identify uses and processing of titanium and its alloys

Materials and Processing – Plastics

- Identify properties and applications of thermoplastic materials
- Identify properties and applications of thermoset plastics
Materials and Processing – Composites
- Describe the structure and advantages of composite materials
- Explain basic processing procedures for composite materials

Materials and Processing – Wood
- Describe the properties and testing processes for wood

Materials and Processing – Concrete
- Describe constituents and testing procedures for concrete

Materials and Processing – Glasses
- Describe structure, properties, and behavior of glass

Materials and Processing – Ceramics
- Describe structure, properties, and processing of ceramics

Relationships between Processing Variables, Quality, Defects, and Properties
- Explain effects of processing and manufacturing variations on material properties
- Describe the effects of defects on material properties
**Fabrication and Processing of Materials**

- Explain general means for processing materials
- Describe techniques used for metals processing
- Explain methods for processing plastics and composites

**Tooling, Dies, Jigs, and Fixtures Used in Materials**

**Processing**

- Describe general tooling practices
- Explain use of dies and jigs used for metal processing
- Explain use of tooling for plastics and composites processing

**Manufacturing Operations and Quality**

**Management**

- Demonstrate processes to promote quality management practices
- Apply statistical, cost, lifecycle, and related management principles to manufacturing process and management
Core Competencies

General, Materials, and Marine Technicians

www.maritime-technology.org
**Chemical Science Skills**

- Apply safe and environmentally appropriate methods to chemical handling
- Demonstrate knowledge of chemistry fundamentals
- Describe atomic and nuclear structure and radioactive decay

**Physical Science Skills**

- Apply basic concepts of mechanics
- Apply concepts of fluids, heat, and thermal conduction
- Describe and apply concepts of electricity and magnetism
- Apply concepts of light and sound

**Fundamentals of Materials Science and Engineering**

- Identify the general nature of metals
- Discuss the general nature of plastics and polymers
- Describe the general nature of composite materials
- Identify the general nature of semiconductors and optical materials
- Describe the general nature and behavior of ceramics and glasses
- Identify the general nature and properties of other materials used in engineering
- Define stress and strength
- Define strain and deformation
- Explain causes for differing materials properties
- Demonstrate how materials properties are used in engineering design
- Compare thermal, physical, and other properties of materials
- Describe the general nature and behavior of emerging engineering materials
Materials Testing

- Demonstrate the planning and execution of materials experiments
- Apply mechanical testing processes to solid materials
- Perform visual and nondestructive testing methods for solids
- Demonstrate knowledge of standards applied to materials
- Perform appropriate tests on metallic materials
- Perform appropriate tests on polymers and composites
- Perform appropriate tests on wood and concrete
- Perform appropriate tests of liquids

Materials and Processes – Metals

- Define and describe constituents, properties, and processing of steel
- Define and describe types and properties of cast irons
- Identify types, properties, and processing of aluminum and aluminum alloys
- Discuss types and advantages of copper and its alloys
- Explain common uses for zinc and its alloys
- Identify properties and uses of magnesium and its alloys
- Discuss advantages of nickel alloys and their uses
- Identify uses and processing of titanium and its alloys

Materials and Processing – Plastics

- Identify properties and applications of thermoplastic materials
- Identify properties and applications of thermoset plastics
**Materials and Processing – Composites**
- Describe the structure and advantages of composite materials
- Explain basic processing procedures for composite materials

**Materials and Processing – Wood**
- Describe the properties and testing processes for wood

**Materials and Processing – Concrete**
- Describe constituents and testing procedures for concrete

**Materials and Processing – Glasses**
- Describe structure, properties, and behavior of glass

**Materials and Processing – Ceramics**
- Describe structure, properties, and processing of ceramics

**Relationship Between Processing Variables, Quality, Defects, and Properties**
- Explain effects of processing and manufacturing variables on material properties
- Describe the effects of defects on material properties
Fabrication and Processing of Materials

- Explain general means for processing materials
- Describe techniques used in metals processing
- Explain methods for processing plastics and composites

Tooling, Dies, Jigs, and Fixtures Used in Materials

Processing

- Describe general tooling practices
- Explain use of dies and jigs used for metal processing
- Explain use of tooling in plastics and composite materials processing

Manufacturing Operations and Quality Management

- Demonstrate processes to promote quality management practices
- Apply statistical, cost, lifecycle, and related management principles to manufacturing processes and management
Core Competencies
Nanotechnology
www.nano-link.org
**Applied Chemical Science Skills**

- Apply safe and environmentally appropriate methods to chemical handling
- Demonstrate knowledge of chemistry fundamentals
- Explain atomic and nuclear structure and radioactive decay

**Applied Physical Science Skills**

- Apply basic concepts of physics
- Effects of processing and manufacturing variables on material properties
- Ability of technician to utilize equipment and measurement techniques
- Ability to operate product assembly and characterization systems
- Ability to enhance product or process quality
- Identify the fundamental aspects of materials used in nanotechnology

**Materials and Device Processing**

- Abilities using photolithography
- Abilities using x-ray lithography
- Abilities using spm-based lithography
- Abilities using e-beam lithography
- Abilities using nanomanipulation
- Abilities using plasma etching
- Abilities using wet chemical etching
Nanoscale Materials Synthesis Processes

- Abilities in thin film deposition
- Abilities in electro-deposition
- Abilities in physical vapor deposition and evaporation
- Abilities in chemical vapor deposition
- Abilities relative to self-assembly of particles

Analysis Methods

- Abilities in optical and laser analysis
- Abilities in x-ray diffraction
- Abilities in optical and electron spectroscopy
- Abilities in surface analysis methods
- Abilities in scanning electron microscopy
- Abilities in scanning probe microscopy
- Abilities in gas adsorption
- Abilities in device failure analysis
Core Competencies
Additive Manufacturing Technicians
www.astm.org
4teamm.org
Additive Manufacturing
- Demonstrate knowledge of .stl file format
- Demonstrate knowledge of tools and uses

Additive Manufacturing Safety
- Demonstrate knowledge of safety in the additive manufacturing workplace

Standard Terminology
- Demonstrate knowledge of terminology used in additive manufacturing

Additive Manufacturing File Format (amf)
- Demonstrate knowledge of additive manufacturing file format (amf)

Coordinate Systems and Test Methodologies
- Demonstrate knowledge of coordinate systems and test methodologies

Principles, Concepts, and Applications in Additive Manufacturing Fundamentals
- Demonstrate proficiency in the principles, concepts, and applications in additive manufacturing equipment
Core Competencies

Additive Manufacturing – Military Applications for Technicians

https://rampmd.org/
To the general Additive Manufacturing core competencies add:

**Demonstrate proper use of basic shop equipment**
(drill press, belt sander, band saw, etc.)
- Efficiently and safely configure, set up and use machine shop equipment
- Be familiar with lock out/tag out procedures
- Identify and use appropriate personal protection equipment

**Hazardous Waste/Safety**
- Understand and interpret material safety data sheets (msds/mds)
- Identify hazardous materials and by-products and their proper handling
- Follow established procedures for handling, use and disposal of hazardous waste and by-products
- Identify and use appropriate personal protection equipment

**Foreign Object and Debris (FOD) Control**
- Understanding processes and controls for materials handling
- Understanding importance of FOD control
- Understand and apply tool accountability measures
Security
- Demonstrate awareness and observance of copyright, trademark and intellectual property
- Understand and follow security and cybersecurity protocols

Coordinate Systems and Test Methodologies
- Optimize the set-up and print process to meet stated specifications
Introduction to Guitar Building/Design Math

- Add, subtract, multiply, and divide whole numbers, with and without a calculator
- Use a standard ruler and metric ruler to measure
- Add, subtract, multiply, and divide fractions
- Convert decimals to percentages and percentages to decimals
- Recognize and use metric units of length, weight, volume, and temperature
- Convert measurements from standard to metric and metric to standard

Measurement, Accuracy, and Quality

- Describe measurement’s role in manufacturing
- Identify types of measurement used in manufacturing
- Understand the importance of calibrating instruments
- Select proper tools for measurement
- Convert units from one measurement system to another
- Lists characteristics of measurement tools
- Perform measurements with general and precision tools
- Describe common measuring errors and proper techniques
- Describe measuring systems

History and Context of Guitar

- Identify origins of guitar
- Identify stringed instruments that lead up to the guitar
- Identify famous luthiers and guitar manufacturers
- Identify components of modern guitar
- Identify role of guitar in modern and historic music
Physics of Sound

- Identify and explain basic concepts of kinetic energy as it pertains to the guitar
- Identify and explain basic wave concepts as they pertain to sound
- Identify basic vibrating systems and describe sound characteristics in those systems
- Identify basic musical systems for describing sound characteristics

Construction, Safety, and Shop Skills

- Show working knowledge of fundamental shop skills
- Understand how tools and fixtures are used in constructing a guitar
- Demonstrate use of common machine tools
- Demonstrate basic skills of fabricating, assembling, and testing a product
- Demonstrate proper use of wood-working tools
- Select appropriate tools for layouts and inspection
- Demonstrate understanding of basic electrical safety
- Identify tools and procedures to form, cut, finish, fasten, and repair
- Follow safety manuals, instructions, and requirements
- Demonstrate proper use of protective equipment
- Name and describe fire hazards and how to control them
- Recognize unsafe practice in forming, separating, and combining processes
- Evaluate safety and fitness of tools, materials fixtures, and jigs
- Demonstrate proper use of a band saw, drill press, disk sander, air compressor and various floor mounted power tools
- Explain when it is appropriate to ask for supervisory help
- Demonstrate proper disposal of used applicators (rags, etc.) and left over finishes

**Electricity and Electronics**

- Describe how voltage, current, resistance, and power are related
- Use Ohm’s law to calculate the current, voltage, and resistance in a circuit
- Use the power formula to calculate how much power is consumed by a circuit
- Describe the differences between series and parallel circuits
- Make voltage, current, and resistance measurements using electrical test equipment
- Construct an electrical circuit from a wiring diagram
- Explain how electricity is created in a magnetic/Piezo circuit

**Manufacturing Computing**

- Explain how and where computers are used in manufacturing
- Demonstrate knowledge of computer software applications in manufacturing
- Explain how production rates are determined
- Explain inventory control, material forecasting, and capacity planning
- Knowledge of work processing, spreadsheets, databases, statistical, and graphics software
- Understand and apply budgeting and master scheduling techniques
**Guitar Construction**
- Define product and process control and explain the importance of each
- Explain factors that affect work in progress
- Use a flow diagram for producing a product
- List major elements in process planning
- Produce a functional and playable guitar

**Guitar Setup, Guitar Repair, and Quality Assurance**
- Identify the components and process for correct setup of guitar
- Use troubleshooting to identify the problem or source of the problem
- Develop solutions using a structured problem solving process
- Use appropriate testing equipment and tools for diagnosing the problem
- Implement the correct strategies to remedy the problem
- Verify correction strategy to remedied the problem

**Current Guitar Market, Manufacturers, and Suppliers**
- Identify companies and organizations involved in manufacturing guitars and guitar equipment
- Identify companies and organizations involved in selling guitar equipment
- Identify companies and organizations involved in supplying guitar equipment components
- Explain ways a company or organization markets itself, including choosing a name, designing logos and promotional materials, advertising, and the importance of word-of-mouth
Wood – Types, Processes, and Management

- Behaviors and characteristics of manufacturing materials
- Characteristics of metallic materials
- Characteristics of plastic materials
- Characteristics of wood materials
- Characteristics of ceramic materials
- Characteristics of composite materials

Project Management and Evaluation

- Processes used to form metallic materials
- Processes used to form plastic materials
- Processes used to form wood materials

Standard Conditioning and Finishing Materials

- Processes used to condition metallic materials
- Processes used to condition plastic materials

Basic CADD Skills

- Create a scaled drawing
- Perform drawing set up
- Construct geometric figures
- Create text using appropriate style and size to annotate drawings
- Use and control enhancement tools accurately
- Create 2D models
- Create objects using primitives
- Revolve a profile to create a 3D object
- Utilize geometry editing commands
- Utilize non-geometric commands
- Control coordinates and displays
- Plot drawings on media using correct layout and scale
- Use layering techniques
- Properly apply dimensioning according to drafting discipline
- Minimize file size
- Knowledge of the coordinate system to identify multiples axis (e.g. X, Y, Z)
**Chemical Science Skills**

- Apply safe and environmentally appropriate methods to chemical handling
- Demonstrate knowledge of chemistry fundamentals
- Describe atomic and nuclear structure and radioactive decay

**Physical Science Skills**

- Apply basic concepts of mechanics
- Apply concepts of fluids, heat, and thermal conduction
- Describe and apply concepts of electricity and magnetism
- Apply concepts of light and sound

**Fundamentals of Materials Science and Engineering**

- Identify the general nature of metals
- Discuss the general nature of plastics and polymers (behavior and role in industry)
- Describe the general nature of composite materials
- Identify the general nature and properties of other materials used in engineering
- Define stress and strength
- Define strain and deformation
- Explain causes for differing materials properties
- Describe the general nature and behavior of emerging engineering materials
Materials Testing
- Demonstrate the planning and execution of materials experiments
- Apply mechanical testing processes to solid materials
- Perform visual and nondestructive testing methods for solids
- Demonstrate knowledge of standards applied to materials
- Perform appropriate tests of liquids

Materials and Processes – Metals
- Define and describe constituents, properties and processing of steel
- Define and describe types and properties of cast irons
- Identify types, properties and processing of aluminum and aluminum alloys
- Discuss types and advantages of copper and its alloys
- Explain common uses for zinc and its alloys
- Identify properties and uses of magnesium and its alloys
- Discuss advantages of nickel alloys and their uses
- Identify uses and processing of titanium and its alloys

Materials and Processing – Concrete
- Describe constituents and testing procedures for concrete

Materials and Processing – Ceramics (Awareness of)
- Describe structure, properties, and processing of ceramics
**Relationship Between Processing Variables, Quality, Defects, and Properties**

- Explain effects of processing and manufacturing variables on material properties
- Describe the effects of defects on material properties

**Fabrication and Processing of Materials**

- Explain general means for processing materials
- Explain methods for joining

**Manufacturing Operations and Quality Management**

- Demonstrate processes to promote quality management practices
- Apply statistical, cost, lifecycle and related management principles to manufacturing processes and management

**Theory – The Corrosion Cell**

- Apply knowledge of anode/cathode/electrolyte/return path

**Corrosion Mechanisms**

- Details the types of corrosion mechanisms and their characteristics
- Appraise stray current testing and mitigation
- Determine environment factors affections corrosion
Corrosion Control

- Describe types and uses of coatings
- Use cathodic protection to prevent corrosion in pipelines
- Identify types of passivity and how passivation occurs
- Inhibitors and coatings
- Prevent, identify and repair ac corrosion – grounding
- Identify and apply techniques for corrosion inhibitors
- Identify the types of liners

Corrosion Monitoring and Testing

- Apply control, measurement and prevention knowledge to monitor corrosion
- Describe weight and dimensional loss of material
- Describe cathodic protection monitoring equipment and controls
Core Competencies

Design Drafting Technicians

https://www.greenriver.edu/

- Demonstrate Technical Drawing Fundamentals
- Apply concepts and principles of views, dimensioning and cutting planes
- Apply civil drafting concepts and practices
- Demonstrate architectural drawing skills
- Apply structural steel drafting concepts and practices
- Apply structural concrete drafting concepts and practices

Principles, Concepts & Practices of Descriptive Geometry

- Demonstrate the principles, concepts and practices of descriptive geometry

Fundamental Principles, Concepts & Practices of Computer-Aided Drafting (CAD) and Modeling

- Apply the fundamental principles, concepts and practices of CAD

Apply the Fundamental Principles, Concepts and Practices of 3D CAD Modeling

Applications of Principles, Concepts & CAD Practices Across Industries

- Describe CAD use across disciplines
- Apply the use of CAD in the design of fasteners
- Demonstrate an understanding of practices and issues with welding and CAD
- Demonstrate an understanding of practices and issues with casting and CAD
- Demonstrate an understanding of practices and issues with machining and CAD
- Demonstrate the use of x-references in CAD

**Fundamental Principles, Concepts & Practices of AutoCAD**
- Demonstrate the use of AutoCAD
- Demonstrate the use of blocks in CAD

**Principles, Concepts & Practices of 3D CAD Modeling**
- Demonstrate the principles, concepts and practices of 3D CAD modeling

**Machine Design Principles, Concepts & Practices**
- Demonstrate the principles, concepts and practices of machine design

**Principles, Concepts & Practices of Geometric Dimensioning & Tolerancing (GD&T)**
- Demonstrate the principles, concepts and practices of GD&T
3D Printing Principles, Concepts & Fundamentals
- Demonstrate the fundamental principles, concepts and practices of 3D printing

Rapid Prototyping Principles, Concepts & Fundamentals
- Demonstrate understanding of rapid prototyping principles, concepts and practices

Building Information Modeling (BIM) Principles, Concepts & Fundamentals
- Demonstrate the fundamental principles, concepts and practices of building information modeling

Residential & Building Code Requirements & Application
- Demonstrate knowledge of building codes and their application
Core Competencies

Medical Device Technician

www.lwtech.edu
Medical Device Manufacturing Regulatory Law & Compliance
- Demonstrate awareness of medical device regulatory environment
- Demonstrate awareness of quality systems

Fundamental Principles of Medical Device Manufacturing
- Describe the fundamental principles of electro-mechanical manufacturing
- Demonstrate an understanding of quality manufacturing approaches
- Describe the medical device development lifecycle

Processes & Tools for Medical Device Manufacturing
- Read and interpret technical documents
- Demonstrate soldering skills
- Demonstrate the use of microscopes in medical device manufacturing
- Utilize electronic tools and standards as applicable for device manufacturing
- Demonstrate use of mechanical tools as applicable for device manufacturing
- Demonstrate the fundamental principles, concepts and practices of 3D design
- Demonstrate knowledge of the component rework processes

Fundamentals of Software Installation
- Demonstrate the principles, concepts and practices of software installation
Notes
For a complete, detailed view of all the core competencies in this pocket guide, visit the MatEdU website at

materialseducation.org/educators/core-competencies

and the Manufacturing Technology Advisory Group website at

www.mtag-wa-org

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