Alabama State Department of Education
High-Quality Instructional Materials Review Form
Manufacturing (INTRODUCTION TO MANUFACTURING)

Textbook Title: _____
Publisher: _____
Grade Level or Subject Area: _____
Reviewer: _____

SECTION 2: *ALIGNMENT TO ALABAMA COURSE OF STUDY STANDARDS*

____ Number of Standards ____ Number of Standards Met ____ Percentage of Standards Met

Directions for reviewers using this rubric:
Indicate your findings based on the extent to which the criteria were met using 1-4 rating scale. Ratings are equivalent in point value. To determine the percentage of standards met, divide total points obtained by possible points.

4--Exceeds Expectations: All materials reviewed indicate high-quality; none indicate low quality.

3--Meets Expectations: Most or all evidence indicates high quality; little to none indicates low quality. Materials may not be perfect, but Alabama educators and students would be well served and strongly supported by them.

2--Partially Meets Expectations: Some evidence indicates high quality, while some indicates low quality. Alabama educators would benefit from having these materials but need to supplement or adapt them substantively to serve their students well.

1--Does Not Meet Expectations: Little to no evidence indicates high quality; most or all evidence indicates low quality. Materials would not substantively help Alabama educators and students meet the state's expectations for teaching and learning.

IE--Insufficient Evidence: More evidence is needed before a rating can be justified. If you are unsure about a rating because you lack relevant information, be sure to choose this option instead of "defaulting" to a rating of Partially Meets Expectations.

CONTENT STANDARDS: INTRODUCTION TO MANUFACTURING

Each standard completes the stem "Students will...."

Safety						**Citations**
1. Apply safety rules, regulations, and procedures related to manufacturing. Example: plant floor, interpretation of Safety Data Sheets (SDS), Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) rules and regulations	1	2	3	4	IE	
Manufacturing Materials						
2. Identify types of manufacturing materials, including metallic, polymeric, ceramic, and composites.	1	2	3	4	IE	
3. Assess properties of manufacturing materials, including physical, mechanical, chemical, thermal, academic, electrical and magnetic, acoustical, and optical.	1	2	3	4	IE	
Primary Manufacturing Processes						
4. Differentiate among thermal, mechanical, and chemical changes in manufacturing materials.	1	2	3	4	IE	
Secondary Manufacturing Processes						
5. Demonstrate casting and molding processes, including mold preparation and pouring or forcing liquids.	1	2	3	4	IE	
6. Demonstrate die forming and roll forming of materials.	1	2	3	4	IE	
7. Explain separating processes for cutting and shearing material.	1	2	3	4	IE	
8. Explain processes for thermal conditioning, mechanical force, and chemical action.	1	2	3	4	IE	
9. Demonstrate temporary, permanent, two-part, and multiple-part assembling processes.	1	2	3	4	IE	
10. Demonstrate finishing processes, including processes for product protection	1	2	3	4	IE	

and appearance.		
Manufacturing Systems		
11. Compare custom, intermittent, and continuous manufacturing systems.	1 2 3 4 IE	
12. Describe ways to make improvements in manufacturing processes, including value adding, non-value adding, control systems, and factors to control	1 2 3 4 IE	
Drafting Design		
13. Explain the importance of drafting design in today's technological workforce.	1 2 3 4 IE	
14. Demonstrate the safe use of drafting design tools following established procedures and regulations.	1 2 3 4 IE	
15. Demonstrate mathematics skills related to drafting design, including basic fractions, scale reading, and conversion between customary and metric measurements.	1 2 3 4 IE	
Blueprint Reading		
16. Relate information on blueprints to actual locations on the print, including terms, components, and symbols.	1 2 3 4 IE	
17. Construct basic multiview, two-dimensional drawings, including visualizing principal views, creating third-angle projections, selecting proper drawing scale, and organizing layout of primary views.	1 2 3 4 IE	
General		
18. Interpret technical information related to the manufacturing process.	1 2 3 4 IE	
19. Demonstrate financial management, budgeting, and investing as they relate to career goals and objectives in manufacturing industries.	1 2 3 4 IE	
20. Describe the use of slings, common rigging hardware, basic hitch configuration, proper connections, and basic load-handling safety practices.	1 2 3 4 IE	
21. Demonstrate correct use of hand tools and power tools utilized in the manufacturing industries.	1 2 3 4 IE	

Total Points: _____

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Manufacturing (INTERMEDIATE DRAFTING DESIGN)

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PROGRAM: ADDITIVE MANUFACTURING

CONTENT STANDARDS: INTERMEDIATE DRAFTING DESIGN

Each standard completes the stem "Students will...."

Section Views		Citations
1. Demonstrate the proper use of sectional view concepts to create a full section, half section, broken-out section, offset section, revolved section, and a removed section, utilizing cutting planes and applying section lining.	1 2 3 4 IE	
Auxiliary Views		
2. Create drawings of inclined surfaces, constructing primary auxiliary views.	1 2 3 4 IE	
Threads and Fasteners		
3. Create drawings illustrating detailed, schematic, and simplified thread representation, identifying common thread terms.	1 2 3 4 IE	
Pictorial Views		
4. Utilize pictorial concepts to produce an isometric drawing, identifying obliques, trimetric, and diametric views.	1 2 3 4 IE	
Dimensioning		
5. Apply dimensions, notes, and other relevant information to an isometric drafting design project, utilizing American National Standards Institute (ANSI) dimensioning standards. a. Identify and explain dimensioning symbols and tolerances.	1 2 3 4 IE	

Total Points: _____

Alabama State Department of Education
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Manufacturing (INTRODUCTION TO ROBOTICS)

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CONTENT STANDARDS: INTRODUCTION TO ROBOTICS

Each standard completes the stem "Students will...."

ORIENTATION						**Citations**
1. Gather and share information on how robotics has influenced the manufacturing process, citing real-world examples. a. List personal characteristics necessary to succeed in robotics.	1	2	3	4	IE	
2. Demonstrate how to program a robot, using safety devices and hand tools correctly.	1	2	3	4	IE	
Fundamentals of Electrical Current						
3. Gather and share information on chemical, mechanical, and solar sources of electricity.	1	2	3	4	IE	
4. Explain the relationship of the atom to an electrical charge	1	2	3	4	IE	
5. Gather and share information on electrical terms and units of measures, including direct and alternating current measured in amperes, the voltage measured in volts, the resistance measured in ohms, power measured in watts, and conductors and insulators.	1	2	3	4	IE	
6. Diagram components of a basic circuit. a. Design series, parallel, and combination circuits. b. Compute current, voltage, and resistance using available devices	1	2	3	4	IE	
7. Construct electrical circuits utilizing soldering and breadboarding techniques . a. Measure current, voltage, and resistance in electrical circuits.						
Digital Circuits						
8. Demonstrate ethical use of technology and online resources. a. Summarize intellectual property laws, including copyright, trademarks, and patents, and explain the consequences of violating	1	2	3	4	IE	

each type of law.		
Electronic Control Systems		
9. Compare and contrast open-loop and closed-loop control systems. a. Document the differences between manual and automatic control systems.	1 2 3 4 IE	
10. Interpret symbols used in control circuit diagrams. a. Correlate construction, electrical, and mechanical schematic symbols to real-world devices.	1 2 3 4 IE	
11. Compare programming methods and the input and output devices used in motion control systems. a. Identify ways programmable logic controllers can be used. b. Develop a ladder logic diagram to perform a specific function. c. Model ladder logic programs for multiple programmable logic controllers.	1 2 3 4 IE	
Design		
12. Explain and utilize robotics design terms, including *controller, teach pendant, manipulator, end-effector and end-of-arm tooling, degrees of freedom, work envelope, and power supplies*	1 2 3 4 IE	
13. Compare and contrast types of robot configurations, including revolute, selective compliant assembly robot arm (SCARA), Cartesian, cylindrical, spherical, and jointed-arm. a. Describe the use of specialty robots in automated systems.	1 2 3 4 IE	
Operation		
14. Demonstrate the proper use of input and output devices for performing robotic tasks.	1 2 3 4 IE	
15. Explain the operation of fluid power systems used in robotic systems.	1 2 3 4 IE	
16. Debug a robotic work cell. a. Identify robotic abnormalities.	1 2 3 4 IE	

b. Change errors in robotics programs		

Total Points: _____