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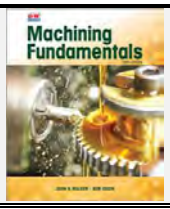
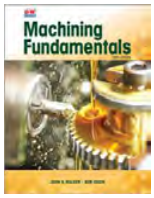
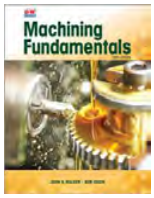
Correlation of Machining Fundamentals©2019
to South Carolina Department of Education
Course Code: 6231 Machine Tool Technology II (Grades 9–12)



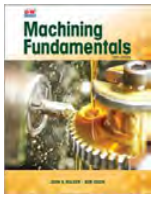
Standards	Correlating Text Pages
A. Safety	
1. Review school safety policies and procedures.	28-36, 99, 101-102, 103-104, 109, 113, 115, 156, 166 172, 206, 235-236, 312-313, 384, 398-399, 447-449, 516
2. Review classroom safety rules and procedures.	28-35
3. Review safety procedures for using equipment in the classroom.	28-35
4. Identify major causes of work/related accidents in office environments.	28-35
5. Demonstrate safety skills in an office/work environment.	28-35
B. Student Organizations	
1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).	19
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.	19
3. Explain the benefits and responsibilities of being a member of a CTSO.	19
4. List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.	19
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.	19
C. Technology Knowledge	
1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.	21-22, 23
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.	23
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.	23
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., piracy; illegal downloading; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).	23, 445
5. Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, and other elements for personal use.	23, 445



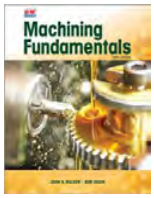
Standards	Correlating Text Pages
6. Describe ethical and legal practices of safeguarding the confidentiality of business-related information.	445
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.	23, 445
D. Personal Qualities And Employability Skills	
1. Demonstrate punctuality.	21-22
2. Demonstrate self-representation.	21-22
3. Demonstrate work ethic.	21-22
4. Demonstrate respect.	21-22
5. Demonstrate time management.	21-22
6. Demonstrate integrity.	21-22
7. Demonstrate leadership.	21-22
8. Demonstrate teamwork and collaboration.	21-22
9. Demonstrate conflict resolution.	21-22
10. Demonstrate perseverance.	21-22
11. Demonstrate commitment.	21-22
12. Demonstrate a healthy view of competition.	21-22
13. Demonstrate a global perspective.	21-22, 471
14. Demonstrate health and fitness.	21-22
15. Demonstrate self-direction.	21-22
16. Demonstrate lifelong learning	25
E. Professional Knowledge	
1. Demonstrate effective speaking and listening skills.	21-22
2. Demonstrate effective reading and writing skills.	21-22
3. Demonstrate mathematical reasoning.	21-22, 572-594
4. Demonstrate job-specific mathematics skills.	590-594
5. Demonstrate critical-thinking and problem-solving skills.	572-594
6. Demonstrate creativity and resourcefulness.	21-22
7. Demonstrate an understanding of business ethics.	445
8. Demonstrate confidentiality.	21-22, 445
9. Demonstrate an understanding of workplace structures, organizations, systems, and climates.	21-22
10. Demonstrate diversity awareness.	471
11. Demonstrate job acquisition and advancement skills.	19, 22-23, 25
12. Demonstrate task management skills.	21-22
13. Demonstrate customer-service skills.	21-22
Machine Tool Technology Level 2	
F. Job Process Planning And Management	
1. Write a detailed process plan that includes a quality plan for a part requiring milling, drilling, turning, or grinding.	6, 188-198, 202-207, 237-241, 257-258, 293-294, 317-334, 348-370



Standards	Correlating Text Pages
2. Produce an operation sheet detailing the process plan.	6, 188-198, 202-207, 237-241, 257-258, 293-294, 317-334, 348-370
3. Identify all critical dimensions and required speeds and feeds.	183, 231-234, 306-307, 594, 602-604
4. Provide sketches as needed.	6, 188-198, 202-207, 237-241, 257-258, 293-294, 317-334, 348-370
G. Print Reading/Drawing (GD&T)	
1. Fundamentals of Geometric Dimensioning	487-483
a. Verify the purpose of dimensions in a drawing.	471-473
b. Match commonly used dimension symbols and terminologies with their purpose.	471-473, 629
c. Identify size dimensions.	471-483
d. Identify diameter dimensions.	471-483
e. Identify radius dimensions.	471-483
f. Identify angular dimensions.	471-483
g. Identify datum dimensions.	471-483
h. Identify location dimensions.	471-483
i. Understand dimensioning standards for threaded fasteners.	130-139
j. Calculate dimensions on a blueprint.	38-51
k. Demonstrate how precision dimensions are expressed.	471-483
l. Understand what the drawing scale means.	471-483
2. Fundamentals of Geometric Tolerancing	473-483
a. Verify different tolerancing methods used in GD&T.	473-483
b. Identify tolerances located on an engineering drawing.	473-483
c. Identify different tolerance types.	473-483
d. Verify the purpose of tolerances.	473-483
e. Identify the symbols used when tolerancing.	473-483
f. Identify the terms used when tolerancing.	473-483
g. Identify and interpret the different tolerancing methods.	473-483
h. Interpret clearance, interference, and transition fits.	473-483
H. Quality Control And Inspection	
1. Develop an inspection plan and inspect simple parts using precision tools and techniques.	456-468
2. Prepare reports on the compliance of the parts.	456-468
3. Precision Measurement	456-468
a. Slide Calipers	
1) Decipher between a vernier, dial, and digital precision caliper.	56-65
2) Identify the three different measurements that can be taken with precision calipers.	56-65



Standards	Correlating Text Pages
3) Clean and calibrate precision calipers.	56-65
4) Identify specifications that should be measured with a precision calipers.	56-65
5) Identify the different components of precision calipers.	56-65
6) Use, read and interpret an inch Vernier precision caliper.	56-65
7) Use, read and interpret a metric Vernier precision caliper.	56-65
8) Use, read and interpret a dial precision caliper.	56-65
9) Use, read and interpret a digital precision caliper.	56-65
b. Micrometers	
1) Identify different types of micrometers.	56-61
2) Identify the different components of micrometers.	56-61
3) Understand the mechanics of a micrometer.	56-61
4) Properly handle and maintain micrometers.	56-61
5) Properly test and calibrate micrometers.	56-61
6) Use, read and interpret outside micrometers.	56-61
7) Use, read and interpret depth micrometers	56-61
I. Job Execution	
1. Lay Out Bolt Circles, Angles, Points of Tangency, and Profiles of a Line.	
a. Set up and lay out bolt circles, locations of surfaces related by non-right angles, locations of points of tangency between arcs and lines, and profiles of a line which is non-arc based.	81-90
2. Contour Band Sawing	
a. Set up and perform contour sawing to a layout.	161-164
b. Choose and mount appropriate blades.	161-164
c. Weld, break, and re-weld blades as necessary.	161-164
3. Turning: Between Centers Taper Turning	
a. Set up and perform between centers turning for straight and tapered turning by offsetting the tailstock.	237-241, 266-272
4. Turning: Chucking, O.D. and I.D. Tapers Using a Taper Attachment	
a. Set up and perform tapered boring and turning using a taper attachment.	266-272
5. Vertical Mill: Precision Location of Holes	
a. Set up and perform boring for location, size, and finish.	317-324



Standards	Correlating Text Pages
6. Milling: Keyseats	
Set up and perform milling keyseats on a shaft.	321-323, 330-332
7. Surface Grinding, Horizontal Spindle, Reciprocating Table	
a. Setup and operate manual surface grinders with an 8” and smaller diameter wheel.	348-349
b. Perform routine surface grinding, location of surfaces, and squaring of surfaces.	320, 328, 348-349
c. Perform wheel dressing.	205
d. Perform visual safety inspection.	206
e. Mount and dress a grinding wheel in preparation for surface grinding.	202-207
f. Ring test grinding wheel.	204
8. CNC Programming and Operations	
a. Set up and operate a computerized-numerical-control (CNC) machine for lathe and mill operations.	9-10, 48, 392-402
b. Develop a program using NC (G-code) for the manufacture of a simple part using the principles of Cartesian coordinates.	410-416
J. General Housekeeping And Maintenance	
1. Keep the duty station clean and safe for work.	28, 384
2. Keep the tools, workbenches, and manual equipment clean, maintained, and safe for work.	28, 384
K. Preventive Maintenance: Machine Tools	
1. Inspect and assess the general condition of an assigned machine tool.	384
2. Make routine adjustments as necessary and as authorized.	384
3. Report to supervision problems which are beyond the scope of authority.	384
4. Carry out daily, weekly, and/or monthly routine upkeep chores cited on checklists for a given machine tool.	384
L. Tooling Maintenance	
1. Inspect and assess the condition of tooling.	384
2. Refurbish tooling where appropriate.	384
3. Refer tooling for repair or regrind where appropriate.	384

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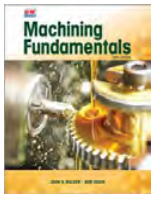

Standards	Correlating Text Pages
M. Industrial Safety And Environmental Protection: Machine Operations And Material Handling	
1. Carry out assigned responsibilities while adhering to safe to safe practices in accordance with OSHA requirements and guidelines.	31-32
2. Document safety activities as required.	31-32
N. Hazardous Materials Handling And Storage	
1. Handle and store hazardous materials as assigned while adhering to safe practices in accordance with OSHA and EPA requirements and guidelines.	28-35
2. Document safety activities as required.	28-35
O. Career Management And Employment Relations	
1. Analyze modern machine careers.	14-25
2. Develop and explain a short-term career plan and resume.	21-25