Correlation of

Machining Fundamentals,

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to

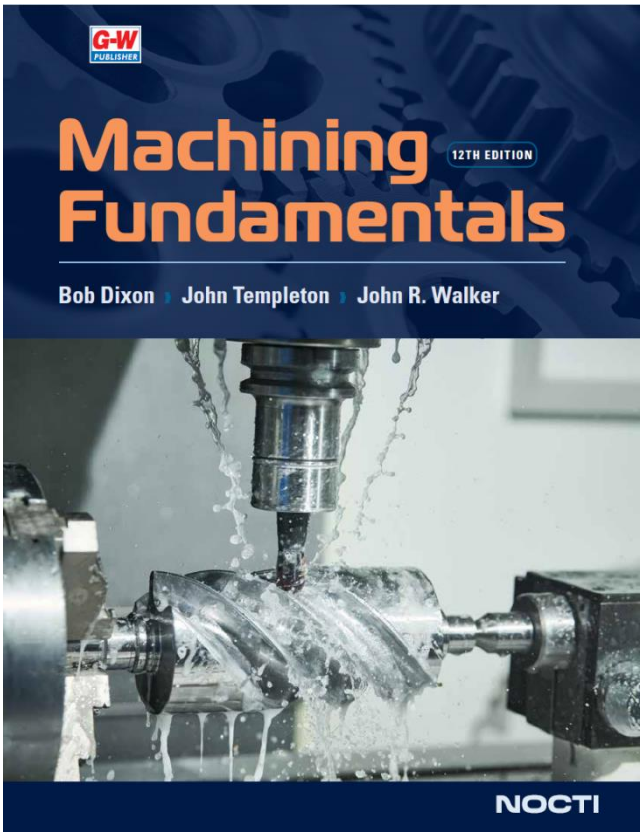
NOCTI Precision Machining Credential

Goodheart-Willcox is pleased to partner with NOCTI and Nocti Business Solutions (NBS), a leading provider of industry certification solutions for skill verification across the nation. With over 55 years of experience, NOCTI/NBS is a valuable partner both within the CTE community and industry to improve America's workforce. Goodheart-Willcox has created correlations between select products and the standards and competencies that are the basis for NOCTI/NBS credentials, to the benefit of states, instructors, and students working toward NOCTI/NBS credentials.

NOCTI/NBS certifications (knowledge-based and skill-based) are developed by national teams of subject matter experts as part of the process that meets personnel accrediting standards and requirements under ISO 17024, resulting in credentials measuring skills and competencies critical for learner success outside the classroom. NOCTI/NBS offers test development, test delivery, and psychometric services to support skill verification, using the latest tools and methods to provide relevant and helpful solutions for workforce development.

The following chart correlates the *Machining Fundamentals* textbook to the NOCTI/NBS national standards and competencies for Precision Machining. Corresponding content from the *Machining Fundamentals* textbook that can be used by a learner to help achieve the standards and competencies is listed in the right column.

For more information about NOCTI, visit https://www.nocti.org.



Standard / Competency	G-W Content
Organization and Shop Safety Practices	
Demonstrate safe work habits and operating procedures	Textbook: pg. 33–44, 210, 228, 260–261, 298–299, 376–377, 409–410, 423–424, 444–445, 584–585

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Standard / Competency	G-W Content
Clean and maintain personal work area and equipment	Textbook: pg. 93–94, 99–100, 104, 106, 135, 297–298, 365–367, 369–370, 591–592
Select and appropriately use cutting fluids	Textbook: pg. 193–197, 239–240
Identify and appropriately use Personal Protective Equipment (PPE)	Textbook: pg. 34–35
Identify environmental and safety considerations established by the EPA, OSHA, and listed in SDS publications	Textbook: pg. 35, 42–44
Measurement and Inspection	
Identify, select, and calibrate precision and semi-precision measuring tools	Textbook: pg. 95–98, 100–103, 104–114
Measure workpiece to verify compliance with print specifications	Textbook: pg. 96–99, 101–103, 110–112
Display knowledge of quality control standards and process improvement, including SPC	Textbook: pg. 534–544
Metallurgical Processes and Heat Treating	
Identify the properties and characteristics of common metals and their effect on machinability	Textbook: pg. 564–568, 570–575
Identify the AISI/SAE and UNS steel identification systems	Textbook: pg. 568–570
Identify heat treating processes and objectives	Textbook: pg. 579–582, 585–588
Blueprint Interpretation and Process Planning	
Interpret blueprints including geometric dimensioning and tolerancing (GD&T) symbols	Textbook: pg. 74–83, 551–553
Develop an order of operations (process plan) based on blueprint specifications	Textbook: pg. 78–83, 550–552
Layout and Benchwork	
Identify and appropriately use hand tools	Textbook: pg. 119–127, 132–153
Identify and safely use power hand tools	Textbook: pg. 33–37, 219–220, 228, 260–261
Grind and shape tools using a pedestal/bench grinder	Textbook: pg. 256–258
Perform semi-precision and precision layout	Textbook: pg. 127–128
Band Saw Machines	
Identify parts and preventive maintenance of a band saw	Textbook: pg. 205–208, 212–215
Explain safe principles of operation	Textbook: pg. 210–211, 219–220

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Standard / Competency	G-W Content
Set up and perform band saw machine operations	Textbook: pg. 209–210, 215–219
Lathes	
Identify parts and preventive maintenance of a lathe	Textbook: pg. 3, 266–271, 297–299
Explain safe principles of operation	Textbook: pg. 266, 298–299
Select and maintain appropriate tools	Textbook: pg. 280–286, 288
Calculate appropriate cutting speed, feed rate, and depth of cut	Textbook: pg. 294–296
Grind and form lathe tools	Textbook: pg. 257, 258, 261–262
Demonstrate knowledge of various workholding methods (e.g., independent and universal chucks, collets, faceplate, between centers, steady and follower rests)	Textbook: pg. 269–280
Set up and perform lathe machine operations (e.g., turning, boring, threading, taper turning, knurling, grooving and cut-off, drilling and tapping, ling, polishing)	Textbook: pg. 310–322
Identify appropriate uses for carbide inserts	Textbook: pg. 283–286
Milling Machines	
Identify parts and preventive maintenance of a mill	Textbook: pg. 3–4, 7, 358–370, 401–402
Explain safe principles of operation	Textbook: pg. 376–377, 409–410
Select and maintain appropriate tools	Textbook: pg. 360–366, 372–376
Calculate appropriate cutting speed, feed rate, and depth of cut	Textbook: pg. 370–372
Explain various workholding methods (e.g., mill vise, table set-ups, angle plates, indexing heads, v-blocks)	Textbook: pg. 372–376
Set up milling machines (e.g., head alignment, vise alignment, tool holder selection, establishing a part zero, set DRO use)	Textbook: pg. 381–387, 394, 396–400
Perform milling operations (e.g., pocketing, slotting, hole-making, peripheral and face milling)	Textbook: pg. 357–358, 387–394, 402–409
Surface Grinding	
Identify parts and preventive maintenance of a surface grinder	Textbook: pg. 414–416, 423–424
Select appropriate grinding wheel	Textbook: pg. 416–421

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Standard / Competency	G-W Content
Explain safe principles of operation (e.g., wheel mounting and dressing, ring testing, workholding, grinding parallel and perpendicular surfaces)	Textbook: pg. 415–416, 419–423
Computer Numerical Control (CNC) Programming, Preparation, Operations	
Demonstrate knowledge of the axis and coordinate systems	Textbook: pg. 8–9, 445–447, 468–471, 493–495, 502
Read and write basic G and M codes	Textbook: pg. 457–464, 471–479, 497–501, 503, 509–511
Perform basic setup and operation for CNC lathe (e.g., work offset, tool offset, workholding devices, toolholding devices)	Textbook: pg. 441–444, 495–508
Perform basic setup and operation for CNC mill (e.g., work offset, tool offset, workholding devices, toolholding devices)	Textbook: pg. 468–489
Drill Press	
Identify parts and preventive maintenance of a drill press	Textbook: pg. 6, 225, 240–243
Determine appropriate tooling and workholding devices	Textbook: pg. 233–237
Explain safe principles of operation (e.g., drilling, reaming, countersinking, counterboring, tapping)	Textbook: pg. 226, 228, 242–252

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