

Competency Profile for MACH 171 – Blueprint Reading
updated 12/2002

It is expected that the student acquire a working knowledge of the uses and conventions for the following categories.

- 1) Identify Lines
 - a) Visible
 - b) Hidden
 - c) Section
 - d) Centerline
 - e) Dimension
 - f) Extension
 - g) Leader
 - h) Cutting plane
 - i) Viewing plane
 - j) Short break
 - k) Long break
 - l) Phantom
 - m) Chain
- 2) Be familiar with Dimensioning Systems
 - a) Fractional
 - b) Decimal Inch
 - c) Dual
 - d) Si Metric
- 3) Perform Decimal rounding conventions for Inch systems
- 4) Read Title Blocks
- 5) Recognize and interpret Drawing Notes
- 6) Recognize and interpret Revision Designations
- 7) Recognize and interpret Diameter symbol
- 8) Recognize and interpret Symmetry symbol
- 9) Have an understanding of Tolerance conventions
 - a) Unilateral
 - b) Bi-lateral
 - c) Basic dimensions
 - d) Limits
- 10) Perform calculations for tolerance 'stack up'
- 11) Perform Bolt circle calculations
- 12) Understand basic Trigonometry
 - a) Sine
 - b) Cosine
 - c) Tangent
 - d) Solve right triangle
- 13) Understand basic Geometry
- 14) Interpret Orthographic Projection
 - a) For Inch based drawings (third angle)
 - b) For Metric based drawings (first angle)
- 15) Perform Isometric sketching from orthographic data
- 16) Understand rules for Precedence of Lines

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- 17) Understand Dimensioning methods
 - a) Chain
 - b) Broken chain
 - c) Datum
- 18) Understand Foreshortened views
- 19) Understand Included angles
- 20) Understand Reference dimensions
 - a) Blind holes
 - b) Chamfers
 - c) Keyseats and keyways
 - d) Counterbore conventions
 - e) Countersink conventions
- 21) Understand Casting Symbology and Finish Allowance
- 22) Understand usages of Fillets
- 23) Understand usages of Rounds
- 24) Understand usages of Half-views
- 25) Understand Surface Finish and demonstrate and ability to interpret
 - a) Ra
 - b) Waviness
 - c) Lay
 - d) Roughness width cutoff
 - e) Φ and microinch
 - f) lay symbols
 - g) machining required symbol
 - h) machining not allowed symbol
 - i) material removal allowance
- 26) Understand Bosses/Pad conventions
- 27) Perform Taper calculations and conventions
 - a) Convert TPI and TPF to degrees/minutes/seconds and Decimal Degrees
- 28) Understand Necks
- 29) Understand SAE/AISI nomenclature
- 30) Understand Partial views
- 31) Understand Enlarged views
- 32) Understand Knurls
- 33) Understand Heat treat callouts
 - a) Rockwell Hardness scales (A, B, C etc.)
 - b) Brinell
- 34) Understand Sectional views and Special views
 - a) Full
 - b) Half
 - c) Special
 - d) Revolved
 - e) Broken out
 - f) Ribs in section
 - g) Rotated features
 - h) Removed sections

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- i) Offset sections
- j) Auxiliary views
- k) Inclined planes
- l) Oblique planes
- 35) Understand Thread forms
 - a) Unified
 - b) Classes of fit
 - c) Pipe
 - d) Dryseal
 - e) Metric
 - f) Whitworth
- 36) Perform Thread calculations
- 37) Understand Thread terms
 - a) Major diameter
 - b) Minor diameter
 - c) Pitch
 - d) Pitch diameter
- 38) Understand Repetitive features
- 39) Understand Line Omission
- 40) Understand Violations of true projection
- 41) Understand Arrowless dimensioning
- 42) Perform basic operations using 2D software (AutoCAD/CAM, BobCAD or BobCAD)
- 43) Understand Metric Drawing Symbology
- 44) Understand Metric Thread callouts and conventions (ex. M10 x .75)
 - a) Coordinate dimensioning
 - b) Dual
- 45) Perform Bend Allowance Calculations (Priority)
- 46) Understand Gear Terminology
- 47) Understand Welding Symbology