TAM 121 Syllabus

Course Description:

TAM 121 is basic mathematics course for beginning machinists. This course is designed to acquaint the entry-level tooling and machining student with the mathematical concepts, terms, and formulas required to function as a machinist. The emphasis of the course is upon application of mathematical principles to the machine trades and developing mathematical/mechanical problem-solving skills.

**Course Credits:**3 credits **Course Prerequisites/Co-requisites:**None

Course Learning Outcomes:

By the end of this course, the students will be able to:

* Solve problems involving combinations of powers and roots with other basic arithmetic operations, using a calculator.
* Solve machine technology problems using algebraic equations and formulas.
* Determine unknown angles and side lengths in triangles and polygons using geometric principles.
* Solve problems using geometric principles which involve chords, arcs, central and inscribed angles, perpendiculars, and tangents.
* Compute the unknown angles and side lengths in a right triangle using the sine, cosine, or tangent trigonometric functions.
* Employ auxiliary lines, use geometric principles, and use trigonometric functions to solve machine technology problems.

Textbook:

“Mathematics for Machine Technology, 8th Edition,” by John C. Peterson and Robert D. Smith. ISBN: 978-1-337-79831-0

Assignments:

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| **Assessment #** | **Unit #** | **Topic** |
| Homework 1.1: | 1 | Introduction to Common Fractions and Mixed Numbers |
| Homework 1.2: | 2 | Addition of Common Fractions and Mixed Numbers |
|   | 3 | Subtraction of Common Fractions and Mixed Numbers |
| Quiz 1.1: | 1-3 |   |
| Homework 1.3: | 4 | Multiplication of Common Fractions and Mixed Numbers |
|   | 5 | Division of Common Fractions and Mixed Numbers |
| Homework 1.4: | 6 | Combined Operations of Common Fractions and Mixed Numbers |
| Quiz 1.2: | 4-6 |   |
| Homework 1.5: | 9 | Introduction to Decimal Fractions |
|   | 10 | Rounding Decimal Fractions and Equivalent Decimal and Common Fractions |
| Quiz 1.3: | 9-10 |   |
| Homework 1.6: | 11 | Addition and Subtraction of Decimal Fractions |
| Homework 1.7: | 12 | Multiplication of Decimal Fractions |
| Homework 1.8: | 13 | Division of Decimal Fractions |
| Quiz 1.4: | 11-13 |   |
| Homework 1.9: | 14 | Powers |
| Homework 1.10: | 15 | Roots |
| Homework 1.11: | 16 | Table of Decimal Equivalents and Combined Operations of Decimal Fractions |
| Quiz 1.5: | 14-16 |   |
| **Module 1 Test** | 1-6, 9-16 | Common Fractions and Decimal Fractions |
| Homework 2.1: | 39 | Symbolism and Algebraic Expressions |
| Homework 2.2: | 40 | Signed Numbers |
| Quiz 2.1: | 39 & 40 |   |
| Homework 2.3: | 41 | Algebraic Operations of Addition, Subtraction and Multiplication |
| Homework 2.4: | 42 | Algebraic Operations of Division, Powers and Roots |
| Quiz 2.2: | 41 & 42 |   |
| Homework 2.5: | 43 | Introduction to Equations |
| Homework 2.6: | 44 | Solution of Equations by the Subtraction Addition and Division Principles of Equality |
|   | 45 | Solution of Equations by the Multiplication, Root and Power Principles of Equality |
| Quiz 2.3: | 43-45 |   |
| Homework 2.7: | 46 | Solution of Equations Consisting of Combined Operations and Rearrangement of Formulas |
| Homework 2.8: | 47 | Applications of Formulas to Cutting Speed, Revolutions per Minute and Cutting Time |
| Quiz 2.4: | 46 & 47 |   |
| **Module 2 Test** | 39-47 | Fundamentals of Algebra |
| Homework 3.1: | 50 | Lines and Angular Measure |
| Homework 3.2: | 52 | Types of Angles and Angular Geometric Principles |
| Quiz 3.1: | 50 & 52 |   |
| Homework 3.3: | 53 | Introduction to Triangles |
| Homework 3.4: | 54 | Geometric Principles for Triangles and Other Common Polygons |
| Quiz 3.2: | 53 & 54 |   |
| Homework 3.5: | 55 | Introduction to Circles |
| Homework 3.6: | 56 | Arcs and Angles of Circles, Tangent Circles |
| Quiz 3.3: | 55 & 56 |   |
| **Module 3 Test** | 55, 52-56 | Fundamentals of Plane Geometry |
| Homework 4.1: | 66 | Introduction to Trigonometric Functions |
| Homework 4.2: | 68 | Basic Calculations of Angles and Sides of Right Triangles |
| Quiz 4.1: | 66 & 68 |   |
| Homework 4.3: | 69 | Simple Practical Machine Applications |
| Homework 4.4: | 70 | Complex Practical Machine Applications |
| Quiz 4.2: | 69 & 70 |   |
| **Module 4 Test** | 66, 68-70 | Trigonometry |
| **Final Exam** | Cumulative: Fractions & Decimals, Algebra, Geometry, Trigonometry |