**Course Title: Mathematics Preparatory Workshop for Engineering Students**

**Course Overview:** This intensive workshop is designed to provide incoming engineering students with a comprehensive review of essential mathematics concepts. The course will cover the topics listed below.

**Course Duration:** 50 hours

**Course Objectives:**

1 1 Introduction
    1.1 Critical analysis of definitions and rules.
2 Euclidean geometry
    2.1 Euclidean axioms.
    2.2 Examples of theorems and exercises.
    2.3 Elements of solid geometry and exercises.
3 Literal calculation
    3.1 Monomials and polynomials. Sums, products, exponentiation.
    3.2 Simplification of expressions. Common factor collection.
    3.3 First- and second-degree equations.
4 Introduction to functions
    4.1 Domain, image. Composition and inversion. Elementary functions.
5 Exponentials and logarithms
    5.1 Exponentials and logarithms. Calculation rules, simplification of expressions.
    5.2 Equations $\exp(x) = c$, $\ln(x) = c$.
    5.3 Inequalities $\exp(x) \leq c$ (and $\exp(x) \geq c$), $\ln(x) \leq c$ ($\ln(x) \geq c$).
6 Trigonometry
    6.1 Definition of arc. Definition of the functions $\sin x$, $\cos x$, $\tan x$.
    6.2 Addition formulas for trigonometric functions.
    6.3 Doubling and bisection formulas.
    6.4 Formulas for solving right-angled triangles. Law of sines.
7 Analytic geometry
    7.1 Definition of a straight line in the plane.
    7.2 Conics in the plane.
    7.3 First- and second-degree inequalities.

**Assessment**
- Weekly quizzes to assess understanding of concepts.
- Participation in hands-on exercises and problem-solving sessions.
- Final assessment based on problem-solving assignments and workshop participation.

**Materials:**

- Lecture notes and problems provided by the instructor.
- Reference materials on mathematical concepts.