**Name of Course**

**Calculus and statistics**

**Course Level**: Grade 12

**COURSE DESCRIPTION**.

* This course enables students to pursue college level studies while still in high school through this course , it provides willing and academically prepared students with the opportunity to earn college credit through the study of collection analysis, interpretation, presentation and organization of data in applying statistics and calculus in real life , and enlarges their skills to the study of change which is part of modern mathematics education

**COURSE OBJECTIVES:**

The GOALS are to enable students to:

* 1. Solve oblique triangles by using the law of sine or the law of cosine
  2. Find areas of oblique triangles
  3. Use sum and difference identities to evaluate and solve trigonometric functions
  4. Use double-angle, power-reducing, and half-angle identities to evaluate trigonometric expressions and solve trigonometric equations
  5. Be able to investigate the strength and direction of a relationship between two variables by collecting measurements and using suitable statistical analysis
  6. Be able to evaluate and interpret the product moment correlation coefficient and spearman's correlation coefficient
  7. Be able to find equations of regression lines and use them when appropriate
  8. Evaluate limits of polynomial and rational functions at selected point
  9. Evaluate limits of polynomial and rational functions at selected point
  10. Evaluate limits of polynomial and rational function at infinity
  11. Construct a probability distribution, and calculate it's summary statistics
  12. Construct and use a binomial distribution, and calculate it's summary statistics Apply the definition of the integral to model problems in physics, economics, etc., obtaining results in terms of integrals.
  13. Demonstrate knowledge of the Fundamental Theorem of Calculus, and use it to interpret integrals as anti-derivatives.
  14. Use definite integrals in problems involving area, velocity, acceleration, and the volume of a solid.
  15. Compute, by hand, the integrals of a wide variety of functions using substitution.
  16. Apply the rules of integration to functions. Use definite integrals in problems involving area between two curves, volume of a solid, and arc length and surface area of a revolution.
  17. Apply the rules of integration to functions. Use advanced techniques to evaluate integrals, including integration by parts, trigonometric integrals, trigonometric substitution and partial fractions.
  18. Use differentiation and algebric manipulations to sketch, by hand, graphs of function
  19. Identify maxima, minima
  20. Demonstrate knowledge of both the definition and graphical interpretation of continuity of a function.
  21. Apply the definition of continuity to a function at a point and determine if a function is continuous over an interval

**PREREQUISITES**: completion of Math course

**REQUIRED MATERIA**

Work Sheets

**Explanation of Topics**

**First semester**

**title** : limits

**Lessons**

* **Theorems 1,2&3**
* **Theorem 4**
* **Theorem 5**

**lessons**

* **Differentiation &Integration**
* **Higher derivative**
* **Existence of limit & Continuity**

**Lessons**

* **Behavior of function**
* **Continuous random variables**
* **Normal distribution**
* **Related time rate**

**Second semester:**

**Title** : statistics

**Lessons**

* **Correlations**
* **Regression**
* **Discrete random variables**
* **Probability**

:title : trigonometry

**Lessons:**

* **Directed angle**
* **Angle in the standard position**
* **Positive & negative measures**
* **Co-terminal angles**
* **Basic trigonometric function & their reciprocals**
* **Systems of measuring angles ( degree – radians)**
* **ASTC rule**
* **Some related angles**
* **surface area of triangle using sine an angle**
* **the sine curve and cosine curve**

**Title** : The sine law & cosine law

Lessons :

* **Solving on triangles, elevations & depression**
* **Sum and difference between measures of two angles**
* **Multiple – Angle**

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**COURSE EVALUATION**

Quarter Grades:

40% : Final Exam

20% : weekly quizzes/classwork

20% : Assignments

20% : Projects

**Semester Grade:**

50% : 1st Quarter

50% : 2nd Quarter

**Yearly Grade**:

50% : 1st Semester

50% : 2nd Semester