



A) COURSE

Course Id:	Course
0000	GEOMETRY AND TRIGONOMETRY

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
3	2	3	0	80

B) GENERAL COURSE INFORMATION

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:	I	I	I	I	I
Course Type (Required/Elective)	Required	Required	Required	Required	Required
Prerequisite Course:	None	None	None	None	None
CACEI Classification:	CB	CB	CB	CB	CB

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:
To homogenize the basic knowledge of Algebra, Geometry and Trigonometry, so that the student may reinforce the solid facts of basic math included in the study plan.

D) TOPICS (CONTENTS AND METHODOLOGY)

1.- ALGEBRA	
Specific Objective:	<p>On concluding the present unit, the student will be able to:</p> <ul style="list-style-type: none"> a) Handle and apply exponents and radicals in the different Algebra operations b) Know the difference between the different types of factorization c) Outline first and second degree equations as representative models of reality d) Solved the equations mentioned e) Graphically interpret first and second-degree functions and the solution to the equations. f) Understand the solution to second-degree equations in a field of complexes. g) Outline linear and quadratic equation systems, as models of reality h) Solve said models through different methods i) Graphically interpret the equation systems j) Justify the law of exponents and logarithms k) Transform an exponential expression into a logarithmic one and vice versa l) Outline and solve Outline and solve exponential and logarithmic equations, as models of reality m) Explain the fundamental concepts regarding the Newton binomial, obtain the value of the nth term and its applications n) Identify and solve the different types of partial fractions



1. Fundamental operations with Algebra expressions
 - 1.1 Elimination of grouping signs, addition, subtraction, multiplication and division
 - 1.2 Notable products
 - 1.3 Factorizing
 - 1.4 Fractions
 - 1.4.1 Exponents, radicals, and their general laws
 - 1.5 Operations with exponents and radicals in a general form
 - 1.2 Equations
 - 1.2.1 First degree equations with one variable, application problems
 - 1.2.2 Simultaneous linear equations, two equations with two incognites, three equations with three incognitos Solving systems by determinants, Applications: Problems that may be solved through a linear equation system
 - 1.2.3 Quadratic equations or second degree with one incognite
 - 1.2.4 Equations of the quadratic type
 - 1.2.5 Equations with radicals
 - 1.2.7 Second degree equation systems Applications: problems that may be solved through quadratic equations
 - 1.3 Logarithms
 - 1.3.1 Logarithm Properties, Exponential form
 - 1.3.2 Antilogarithm and co-logarithm
 - 1.3.3 Exponential and logarithmic equations
 - 1.4 Binomial theorem
 - 1.4.1 Development of the Binomial theorem
 - 1.4.2 Characteristics
 - 1.4.3 General term
 - 1.5 Partial fractions
 - 1.5.1 Different linear factors
 - 1.5.2 Repeated linear factors
 - 1.5.3 Different quadratic factors
 - 1.5.4 Repeated quadratic factors

Readings and other resources	Readings to investigation of concepts, as well as to complement and strengthen the topics discussed in class.
Teaching methods	Exhibition topics by teacher and / or students; use of some didactic techniques like teamwork, learning based in problems and/or projects.
Learning activities	Exercise class and homework, as well as them respective interpretation of results.

2.- EUCLIDIAN GEOMETRY.	
Specific Objective:	On concluding the teaching process and having achieved the learning, the student will be able to: <ol style="list-style-type: none"> a) Interpret elemental principles of geometry, which he will apply toward solving problems. b) Know the definitions and postulates of Euclid, as axiomatic bases of the Euclidian Geometry. c) Identify the type of triangles according to their sides and angles, as well as tell between the outstanding lines in the triangle. d) Correctly apply the triangle, quadrilateral and polygon theorems in general while solving problems. e) Demonstrate the most important theorems of Euclidian Geometry, while having as a basis, the congruence and similarity. f) Apply the Pythagorean theorem as a model of real problems.



2.1 Concepts and fundamental elements of Euclidian Geometry	
2.1.1 Lines and angles	
2.1.2 Axioms of Geometry	
2.1.3 The line and types of lines	
2.1.4 Angles and types of angles	
2.1.5 Demonstration of theorems regarding angles	
2.1.6 Perpendicularity and parallelism, demonstration of important theorems (Straightlines cut by a secant and angles formed)	
2.1.7 Angles with parallel or perpendicular sides, Theorems	
2.2 Triangles	
2.2.1 Triangles, type of triangles and their properties	
2.2.3 Theorems relative to triangles	
2.2.4 Straight lines and notable triangle points	
2.2.5 Triangle congruence	
2.3 Polygons	
2.3.1 Theorems regarding polygons	
2.4 Quadrilaterals	
2.4.1 Classification of quadrilaterals	
2.4.2 Theorems regarding quadrilaterals	
2.4.3 Properties of quadrilaterals	
2.5 Proportionality and similar triangles	
2.5.1 Properties of proportions	
2.5.2 Proportional segments, theorems	
2.5.3 Similarity of triangles, theorems and applications	
2.5.4 Metric relations in triangles	
2.5.5. Pythagorean Theorem, demonstration and applications	
2.5.6 Generalization of the Pythagorean Theorem (Square of the opposite side of an acute angle, square of the opposite side of an obtuse angle)	
2.6 Circumference and circle	
2.6.1 Definition and elements of the circumference and circle	
2.6.2 Angles related to the circumference	
2.6.3 Theorems regarding the circumference and the circle	
Readings and other resources	Readings to investigation of concepts, as well as to complement and strengthen the topics discussed in class.
Teaching methods	Exhibition topics by teacher and / or students; use of some didactic techniques like teamwork, learning based in problems and/or projects.
Learning activities	Exercise class and homework, as well as them respective interpretation of results.

3.- PLANE TRIGONOMETRY		14 horas
Specific Objective:	On concluding this Unit, the student will be able to: <ol style="list-style-type: none"> a) Identify and calculate the trigonometry functions in any quadrant, determine their value and use them in the outlining and solving of problems. b) Establish the relations among the different functions. c) Identify each of the functions in the Trigonometry circle and structure the corresponding graphs. d) Relate the fundamental formulas for the verification of Trigonometry function identities and resolutions e) Build Trigonometry function graphs. f) Solve triangles, rectangles and oblique angles and use them in outlining and solving actual problems. 	



3.1 Different type of angles and their measurements	
3.1.1 Trigonometry angles	
3.1.2 Sexagesimal system and cyclic system	
3.1.3 Measurement of an arch in function of the corresponding angle	
3.2 Trigonometry functions of an acute angle	
3.2.1 Definitions	
3.2.2 Given a trigonometry function, calculate the others	
3.2.3 Trigonometry functions of 30°, 60° and 45° angles	
3.2.4 Angles of elevation and depression	
3.2.5 Fundamental identities	
3.2.6 The use of Trigonometry functions in solving right triangles	
3.2.7 Problems through the solution of right angles applied to real life	
3.3 Functions of any angle, not necessarily acute	
3.3.1 Rectangular coordinates and the Trigonometry functions in the different Quadrants	
3.4 Functions in the Trigonometry circle	
3.4.1 Definitions and signs of the functions in the Trigonometry circle	
3.3.3 Functions of angles greater than 360°	
3.5 Formulas of addition, differences of two angles, and functions of multiple angles	
3.5.1 Sine cosine, tangent of the sum of two angles	
3.5.2 Sine cosine, tangent of the difference of two angles	
3.5.3 Functions of multiple angles in an x given angle (doubles, triples, mids, etc.)	
3.5.4 Products of sines and cosines	
3.5.5 Suma and difference of sines and cosines	
Readings and other resources	Readings to investigation of concepts, as well as to complement and strengthen the topics discussed in class.
Teaching methods	Exhibition topics by teacher and / or students; use of some didactic techniques like teamwork, learning based in problems and/or projects.
Learning activities	Exercise class and homework, as well as them respective interpretation of results.

E) TEACHING AND LEARNING METHODOLOGIES

The topic presentation must be carried out through carefully elaborated analysis, examples, exercises, (workbook) that will steadily lead to the desired results. The professor will use expositions sessions and participation from the student will be essential for developing discussions and analysing point of views from the participants regarding the different study units. Research work and students assignments have the purpose of completing the course topics.

F) EVALUATION CRITERIA

All features demonstrating a change in student conduct such as class participation, extra outside class research assignments, homework; class attendance, teamwork and exams will be considered and taken into account.

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

Main Books:

- Álgebra Elemental Baldor A. Dr. Publicaciones Cultural
- Álgebra Superior Spiegel R. Murray Serie Schamn Ed. Mc. Graw Hill
- Álgebra y Trigonometría Con Geometría Analítica Swokowski Earl Wadsworth International Iberoamericana.
- Geometría Plana y del Espacio Con Trigonometría. Baldor A. Dr. Publicaciones Cultural México.
- Geometría Plana y del Espacio Wentworth Edit. Porrúa, S.A.



- Trigonometría Plana Rice-Stranger Ed. C.E.C.S.A. México.
- Trigonometría Contemporánea Taylor-Wade Ed. Limusa.
- Geometría Moderna Nichols-Palmer Ed. Continental
- Álgebra y Trigonometría con Geometría Analítica Geltner, Peterson-Swokowski-Cole Ed. Thomson

Complementary Books: