

Mathematics 1

Basic Course Information			
Course Number	0305009	Subject Category	Compulsory MB
Class Format	Lecture	Credit Type and Number of Credits	2.5
Department	Electrical and Electronics	Student Category	Year 1
Period of Study	Semester 1	Classes per Week	5
Required Materials	*Thecalculus, mathematics for calculus' 7th edition by and Stewart, Redlin and Watson and *Thecalculus, "College Algebra" 2nd edition by OpenStax		
Instructor	Adriano Klomprens	Alexei Taraske	Plarbin Sammetta

Course Objective
 When completing this course, students will be able to:
 1. Apply basic algebra skills without requiring a review.
 2. Recall the definition of a function, the basic of functions and their graphs, function operations and function transformations.
 3. Recognize various types of functions including polynomial, rational, exponential, logarithmic and trigonometric functions and use the properties of these functions to solve equations and application problems.
 4. Define trigonometric functions understand the right triangle trigonometry and unit circle, and know and apply identities involving the trigonometric functions.

Evaluation/Rubric	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fair)
Evaluation 1	Can draw graphs of any quadratic, power, rational and radical functions and find the domain, range and intercept.	Can draw graphs of basic quadratic, power, rational and radical functions and find the domain, range and intercept.	Can't draw graphs of quadratic, power, rational and radical functions or can't find the domain, range or intercept.
Evaluation 2	Can solve complicated polynomial and rational equations and inequalities by both algebraic and graphic approach.	Can solve basic polynomial and rational equations and inequalities by algebraic or graphic approach.	Can't solve basic polynomial or rational equations or inequalities.
Evaluation 3	Can draw graphs of complicated exponential, logarithmic and trigonometric functions using their properties.	Can draw graphs of basic exponential, logarithmic and trigonometric functions using their properties.	Can't draw basic exponential, logarithmic or trigonometric functions.
Evaluation 4	Can solve complicated equations and inequalities with exponential, logarithmic and trigonometric exponents.	Can solve basic equations and inequalities with exponential, logarithmic and trigonometric exponents.	Can't solve basic equations or inequalities with exponential, logarithmic or trigonometric exponents.

Relationship with Learning Outcomes
0111 Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.
0141 Creativity to make a new value with fusing the knowledge from various fields.

Please change

Teaching Method

Outline:

Class Format: Lecture, Drill, Group Work, and Presentation.

Please Note : Class format is subject to change depending on students' prior knowledge and preparation.

Course Plan	Semester 1	Contents and Method of Courses	Goals	Related MCO
1st Week	Chapter 1: Fundamentals		Can explain the definitions of intervals, absolute value, square root, and complex number.	1, 1, 10
2nd Week	Chapter 2: Functions		Can define a function and draw graphs of basic functions. Can draw graphs by scaling, translation, reflection, and magnification.	1, 1, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
3rd Week	Chapter 2: Linear Functions		Can define linear functions and draw their graphs. Can solve linear equations and inequalities.	1, 1, 13, 30
4th Week	1st Quarter Examination (15%)		1st Week - 3rd Week	
5th Week	Chapter 2: Absolute Value Functions		Can explain and calculate absolute value. Can define absolute value functions and draw their graphs. Can solve absolute value equations and inequalities.	1, 1, 4
6th Week	Chapter 3: Quadratic Functions		Can define quadratic functions and draw their graphs. Can solve quadratic, higher-order equations and inequalities.	1, 1, 7, 8, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
7th Week	Chapter 3: Polynomial Functions		Can define polynomial functions and draw their graphs. Can explain long division on polynomials and use the factor theorem for factorization.	1, 1, 1, 2
8th Week	Chapter 3: Rational Functions		Can define rational functions and draw their graphs. Can solve rational equations and inequalities.	1, 1, 8, 10, 14
9th Week	Midterm Examination (20%)		5th Week - 8th Week	
10th Week	Chapter 3: Radical Functions		Can calculate radicals. Can define radical functions using definition of inverse functions. Can draw the graphs of inverse functions. Can solve radical equations and inequalities.	1, 1, 5, 10, 11, 14, 15
11th Week	Chapter 4: Exponential Functions		Can explain and calculate exponents. Can define exponential functions and draw their graphs. Can solve exponential equations and inequalities.	1, 1, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
12th Week	Chapter 4: Logarithmic Functions		Can explain and calculate logarithms. Can define logarithmic functions and draw their graphs. Can solve logarithmic equations and inequalities.	1, 1, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
13th Week	3rd Quarter Examination (20%)		10th Week - 12th Week	
14th Week	Chapter 5: Trigonometric Ratio		Can calculate the value of the six trigonometric ratios and use them to find lengths and angles of a given triangle.	1, 1, 24, 25, 26
15th Week	Chapter 5: Trigonometric Functions		Can understand how trigonometric functions relate to right triangles and extend the definitions of the trigonometric functions beyond right triangles using the unit circle.	1, 1, 26
16th Week	Chapter 5: Graph of Trigonometric Functions		Can draw graphs of the three trigonometric functions and determine the amplitude, period, and transformations.	1, 1, 27
17th Week	Chapter 5: Trigonometric Equations		Can solve trigonometric equations using angles of the unit circle and graphs of trigonometric functions.	1, 1, 12, 25
18th Week	Chapter 5: Inverse Trigonometric Functions and Law of Sines and Cosines		Can define the three inverse trigonometric functions and find the exact value of expressions involving the inverse trigonometric functions.	1, 1, 22
19th Week	Final Examination (20%)		14th Week - 18th Week	
20th Week	Return answer sheets/review semester and give feedbacks		Summary	

Do not

	Examination	Class Participation	Drill Submission	Report	Permits	Other
Home Ability	20	20	20	20	20	20
Handwriting Ability						
Interdisciplinary Ability						