A1: MATHS & SCIENCE COURSES

Course Name: Calculus **Course Code:** MATH105

General Information						
Course Code	**MATH105**	**Level/Year**	**1/1**	**Required (R) / Selected Elective (SE)**		**R**
Credit Hours	**Theory**	**4**	**Lab**	**-**	**Total**	**4**
Prerequisites	**Nil**	**Course Coordinator**		Mr. Mahmood Naif abu Shaqir		
Corequisites	**Nil**					

Course Description

This course (Calculus) introduces basic topics in mathematics like basic algebraic operations, equations and inequalities and derivatives which will facilitate them for further studies in computer sciences and related studies.

Course Objectives : On completion of the course, the student will be able to:

- Know the basic algebraic operations on real and complex numbers, polynomials and its factorizations.
- Understand the basic rules of limits and continuity, differentiations and integrations.
- Be familiar with the importance of differentiation and integration in branches of science and geometry.

Course Contents

List of Topics

1) Algebraic Operations
2) Equations and Inequalities
3) Quadratic Equations and Cartesian plane
4) Functions
5) Limits and continuity
6) Differentiations
7) Integrations

Textbook

- Samir H.Saker, McGraw Hill, Pre-calculus, 2009
- J. Stewart, Brooks/Cole – Calculus, 2015

• H. Anton- Calculus, Wiley, 12th Edition, 2022	
Reference Materials	
• Michael Sullivan, Precalculus, Pearson, 2024 • R. E. Larson, R. P. Hostetler, and B. H. Edwards, Calculus, Cengage Learning, 2022 • G. B. Thomas, Early Transcendental, Calculus, 2020	
Course Learning Outcomes	
CLO#01	Distinguishing mathematical concepts relevant to basic algebraic operations, equations and inequalities, graph, function, limit and continuity, differentiations and integrations
CLO#02	Identify background, features and structure of Mathematics problems of basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#03	Explain notations and concepts required for the solution of basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, equation of lines, circle, mid-point, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#04	Apply theoretical or practical aspects relevant to course content of basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, equation of lines, circle, mid-point, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#05	Compute numerical quantities for basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, equation of lines, circle, mid-point, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#06	Apply various mathematical rules, techniques and concepts in basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, equation of lines, circle, mid-point, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#07	Solve mathematical problems using critical thinking in basic algebraic operations, polynomial and factorizes, equations and inequalities, graph, equation of lines, circle, mid-point, function, limit and continuity, differentiations, Chain rules, integrations by substitution and by parts.
CLO#08	Cultivate a mathematical attitude and nurture the interest.
CLO#09	Leadership qualities in research and innovation with sense of Commitment and accountability.
CLO#10	Inculcating values and ethics in thought, expression and deed.