

ITEM	DETAILS	
1. Title of subject	MODERN APPLIED MATHEMATICS	
2. Subject code	SEC101	
3. Status of subject	Core	
4. Stage	Year 1	
5. Credit Hour	4	
6. Pre-Requisite	None	
7. Assessment	40% Coursework Test 1 – 10% Test 2 – 10% Assignment 1 – 10% Assignment 2 – 10% 60% Examination	
8. Semester	Semester 1	
9. Objective of subject	To enable students to: <ul style="list-style-type: none"> • Understand basic concepts of algebra and graphs. • Understand basic concepts of calculus. • Understand system of equations, matrices and concepts in series. 	
10. Synopsis of subject	Introduction to basic ideas, theories, concepts and applications of mathematical and linear algebra. Coordinates, Graphs, Lines: real numbers. Sets (Definitions, Intervals, Venn Diagrams, Set Operations, Basic Laws of set Algebra).	
11. Details of subject	Contents	Hours
Week 1	Topic: <ul style="list-style-type: none"> • Number System • Set Theory 	4

	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics Number and set theory. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 1.</p>	
Week 2	<ul style="list-style-type: none"> • Basic Algebra-factorization • Inequalities, Absolute Values 	4
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics algebra, inequalities and absolute values. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 2.</p>	
Week 3	<ul style="list-style-type: none"> • Basic graphs, Introduction to functions • Domain and Range, Transformation 	4
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics basic graphs, functions and transformation. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 3.</p>	
Week 4	<ul style="list-style-type: none"> • Straight lines • Quadratic Functions, Cubic Function • Factor Theorem 	4
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics straight lines, quadratic & cubic functions. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 3.</p>	
Week 5	<ul style="list-style-type: none"> • Limits and graphs continuity at a point 	4
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics limits and graphs. Able to handle questions on topic limits and graphs. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 4.</p>	

Week 6, 7 and 8	<ul style="list-style-type: none"> • Introduction to Differentiation • Basic list of formulae • Product Rule, Quotient Rule, Chain Rule • Function of a function • Implicit Differentiation • Application of differentiation in Optimization • Differentiation from first principles 	12
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topic differentiation. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 5.</p>	
Week 9	<ul style="list-style-type: none"> • Introduction to integration • Integration as Anti-differentiation • Area under a graph • Techniques in integration 	4
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topic integration, area under a graph. 	
	<p>Further reading for this lesson: Whipkey & Whipkey. (1986). Chapter 6.</p>	
Week 10 and Week 11	<ul style="list-style-type: none"> • Introduction to series • A. P. & G. P. • Limits and convergence • Application with series 	8
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topic series, limits and convergence. 	
	<p>Further reading for this lesson: Anton. (2000). Chapters 1, 2, 3.</p>	
Week 12 and 13	<ul style="list-style-type: none"> • Introduction to Matrix • Basic definitions/ theorems • Solutions to System of equations • Determinants • Adjoint Matrix 	8
	<p>Learning Outcomes: At the end of the lesson, students will be able to:</p> <ul style="list-style-type: none"> ▪ Demonstrate skills in solving problems on topics matrix, system of equations, determinants and adjoint matrix. 	

	Activity: Video/Peer Presentation/Debate, etc.		
	Further reading for this lesson: Anton. (2000). Chapters 4, 5, 6.		
Week 14	<ul style="list-style-type: none"> Revision 		4
	Learning Outcomes: Revise selective topics.		
	Activity: Video/Peer Presentation/Debate, etc.		
	Further reading for this lesson: Whipkey & Whipkey. (1986). Anton. (2000).		
	Total		56
12. Text	Compulsory	Whipkey, K. L., & Whipkey, M. N. (1986). <i>The Power of Calculus</i> (4 th ed.). New York: John Wiley & Sons. Anton, H. (2000). <i>Elementary Linear Algebra</i> (8 th ed.). New York: John Wiley & Sons.	
	Reference	Daniel D. Benice, D. D. (2001). <i>Calculus and its Applications</i> (2 nd ed.). Houghton Mifflin Co.	