National University

Of Computer & Emerging Sciences
Karachi

Course Outlines of BS(CS) / BS(SE) Degree Program

Course Instructor	**Mr. Jamil Usmani / Mr. Nadeem Khan / Mr. Shahbaz/ Ms Asma Masood**	**Semester**	FALL
Batch/Section(s)	2019 /BS(CS) section A,B,C,D,E,F,G,H,I,J / BS(SE) section A,B	**Year**	2019
Course Title	MT119- Calculus and Analytical Geometry	**Credit Hours**	3+0
Prerequisite(s)	Pre-Calculus/College Mathematics	**Course TA**	

Text Book(s)

Title of book	1- *Calculus Early Transcecendentals 10th Edition*		
Author(s)	Howard Anton, IRl Bivens, Stephen Davis	Publisher	JOHN WILEY

Reference Book(s)

2-Calculus & Analytical Geometry 9th Edition

George B. Thomas, Ross L. Finney — Publisher

3-Calculus Early Transcendental 8thEdition

James Stewart — Publisher Thomson, 2008

Course Description:

Functions, limits and continuity, The Derivatives, Derivatives of different functions, Application of derivatives, The integrals, integrals of different type of functions, Different Techniques of integrals, integrals application , Lines and plane , distance and angle between the planes.

Course Objective:

This course provides an introduction to differential and integral calculus. The primary aims of the course are to help students develop new problem solving and critical reasoning skills and to prepare them for further study in mathematics, the physical sciences, or computer science.

Tentative Lecture Schedule: *Calculus Early Transcecendentals 10th Edition, Howard Anton*

Week	Contents/Topics	Exercises/Questions	Quizzes/ Assignment
1	Introduction to Relation and Functions, vertical line test, Piecewise and Absolute value function, Domain and Range, one-one and onto function ,Composition of function, Symmetry Test even/odd function	0.1(Q#1-4,7 -10) 0.2(Q#27-36,53- 63)	
2	Basic Concepts of limit. Evaluation of limits. Continuity and point of discontinuity. Types of discontinuity.	1.1(Q#1-16) 1.2(Q#1-32,37-40) 1.5(Q#1-6,11-22 29,30,35,36)	Q1
3	**Differential Calculus:** Secant line, Equation of Normal and tangent line, Slope ,Rate of change Concept and idea of differentiation, Geometrical and Physical meaning of derivatives, Rules and techniques of differentiation. Product and quotient rule Derivative of trigonometric function Chain rule Implicit differentiation	2.1(Q#11-18) 2.2(Q#9-20,46-48) 2.3(Q#1-24,29-47) 2.4(Q#1-30) 2.5(Q#1-28) 2.6(Q#1-58) 3.1(Q#3-18,25-28)	A1
4	Indeterminate forms ,L' Hospital Rule Role's and Mean Value's Theorem.	3.6(Q#1-45) 4.8(Q#1-8)	
5	Applications of Derivative in Graphing: Concavity, Increasing and Decreasing	4.1(Q#6-10,15-30)	
6	**Mid I Exam**		
7	Relative Extrema (Maxima and Minima), 1st derivative and 2nd derivative test Absolute Maxima and Minima	4.2(Q#3-5,7-12,25-40) 4.4(Q#7-16,21-28)	Q2
8	**Integral Calculus:** Concept and idea of Integration Indefinite Integrals. Sigma notation Riemann sums	5.2(Q#1-36) 5.4(Q#1-20,35-48) 5.5(Q#1-24)	
9	Techniques of integration Basic Integration ,Integration by parts Trigonometric substitution Reduction formula , Hyperbolic function	7.1(Q#1-30) 7.2(Q#1-38) 7.4(Q#1-25,37-48) 6.9 (Q11-40)	A2
10	Integration of Rational function by Partial fraction , u=tan(x/2)substitution Improper integrals.	7.5(Q#9-30) 7.6 (Q#65-70,87,88) 7.8(Q#3-32,37-40)	
11	**Mid II Exam**		
12	Applications of Integration, Definite Integrals, Area bounded by the curves. Volume by Disk and washer method	6.1(Q#1-18) 6.2(Q#1-26)	A3
13	Applications of Integration : Arc length	6.4(Q#3-8,27-32)	

14	**Analytical Geometry:** Parametric equations of lines in 3D	11.5(Q#3-10,15-22, 29-34,49,50)	Q3
15	Plane in 3-space ,Distance Problems involving planes, Intersecting planes.	11.6(11-20,41-48)	
16	Revision / Presentation		

Grading Criteria:

Marks Distribution:

Particulars	% Marks
1. Class participation/Attendance	02
2. Quizzes	09
3. Assignments	09
4. First Mid Exam	15
5. Second Mid Exam	15
6. Final Exam	50
Total:-	**100**

Important Instructions to be followed for this Course

- Be in classroom on time. Any student who arrives more than 5 min.late in the class would be marked LATE. Anybody coming to class more than 15 minutes late will be marked ABSENT.
- Turn off your cell phones or any other electronic devices before entering the class.
- Maintain the decorum of the class room all the time.
- Avoid a conversation with your classmates while lecture is in progress.
- Use parliamentary language in the class room as well as in assignments. Refrain from using impolite, vulgar or abusive language in the class room as well as in class presentations and assignments.
- Submit your assignments on time. no assignment will be accepted after the deadline.
- There would be no re- take of any quiz.

Instructions / Suggestions for satisfactory progress in this course:

- On average, most students find at least three hours outside of class for each class hour necessary for satisfactory learning.
- Chapters should be read and homework should be attempted before class.
- Do not get behind. You are encouraged to work with other students. Plus, I am always available during office hours to help you.
- The homework assigned is a minimum. You may always work extra hours on your own.
- Use the few minutes you usually have before the start of each class to review the prior meetings' notes and homework. This will save us valuable in-class time to work on new material.
- Develop a learning habit rather than memorizing.
- Work in groups, whenever appropriate.
- Apply the learned principles and gained knowledge.
- Be creative in thinking, but stick to the topic assigned for discussions, assignments and presentations.
- Always bring your text Books with you in the class.

Note: Students are welcome all the time to get help from the Teacher.