NORTH SOUTH UNIVERSITY
Department of Mathematics and Physics (DMP)

Marks Distribution		
Attendance/Class perf /Asses	:	10%
Assignments	:	05%
Quizzes (minimum 3)	:	10%
Mid Term I	:	20%
Mid Term II	:	20%
Final Exam	:	35%
TOTAL	:	100%

MAT 120: Calculus and Analytical Geometry I

(Sec 5, 6 Spring 2020, 3.0 Credits)

Course Teacher : Dr.Md. Abdul Alim(AdA)
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Lecture Time : 2:40 – 4:10pm(Sec5, Room: SAC 202 on RA
Lecture Time : 4:20 – 5:50pm (Sec6, Room: NAC 618 on RA
Office Room : SAC 1158;(Office Hours : 12:00-2:30pm on RA)

Text Book: Calculus –by HowardAnton, Irl Bivens and Stephen Davis, 10th Edition (Year 2012).

Learning Outcomes:

- Students should develop a working knowledge of the relevant core topics of differential calculus and their application to a variety of situations.
- Students should develop problem solving, critical thinking and analytical skills.
- Students should develop the ability to communicate their thinking both orally and in written form.

Course Contents and Exercises for practice:

0. BEFORE CALCULUS
0.1 Functions **1**
Ex. 1, 9, 10
0.2 New Functions from Old **15**
Ex. 1, 2, 3, 5 - 24, 31 - 34
0.4 Inverse Functions; Inverse Trigonometric Functions **38**
Ex. 9-21 (Odd)
0.5 Exponential and Logarithmic Functions **52**
Ex. 16-29 (Odd)
Review Ex.: 1, 11, 27

1. LIMITS AND CONTINUITY
1.1 Limits (An Intuitive Approach) **67**
Ex. 3, 7, 10, 13 -16
1.2 Computing Limits **80**
Ex. 2-32 (Even), 37- 40
1.3 Limits at Infinity; End Behavior of a Function **89**
Ex. 9-40 (Odd)
1.5 Continuity **110**
Ex. 11 - 22, 29 - 32
1.6 Continuity of Trigonometric, Exponential, and Inverse Functions **121**
Ex. 17 - 40 (Odd), 51, 52

2. THE DERIVATIVE
2.1 Tangent Lines and Rates of Change **131**
Ex. 13,14,17,18,26
2.2 The Derivative Function **143**
Ex. 23, 47-50

2.3 Introduction to Techniques of Differentiation **155**
Ex. 41-55, 65-68
2.4 The Product and Quotient Rules **163**
Ex. 19-22, 29-34
2.5 Derivatives of Trigonometric Functions **169**
Ex. 19-29
2.6 The Chain Rule **174**
Ex. 43-58

3. TOPICS IN DIFFERENTIATION
3.1 Implicit Differentiation **185**
Ex. 1-18 (Even), 25-28
3.2 Derivatives of Logarithmic Functions **192**
Ex. 20-44(Even)
3.3 Derivatives of Exponential and Inverse Trigonometric Functions **197**
Ex. 15-52 (Even), 61,62
3.4 Related Rates **204**
Ex. 5-10
3.5 Local Linear Approximation; Differentials **212**
Ex. 15,16,26-33, 43-46
3.6 L'Hôpital's Rule; Indeterminate Forms **219**
Ex. 7-45 (Even),

4. THE DERIVATIVE IN GRAPHING AND APPLICATIONS
4.1 Analysis of Functions I: Increase, Decrease, and Concavity **232**
Ex. 7, 15-38 (Even)
4.2 Analysis of Functions II: Relative Extrema; Graphing Polynomials **244**
Ex. 37-50
4.4 Absolute Maxima and Minima **266**
Ex. 7-16, 21-28

5. INTEGRATION
5.1 An Overview of the Area Problem **316, Ex. 10-12, 13-18**
5.2 The Indefinite Integral **322, Ex. 11-35 (Even)**
5.3 Integration by Substitution **332, Ex. 15-62 (Even)**
5.4 The Definition of Area as a Limit; Sigma Notation **340, Ex. 39,40,43,44, 47,48**
5.5 The Definite Integral **353, Ex. 13-18, 25-28, 37,38**
5.6 The Fundamental Theorem of Calculus **362, Ex. 13-34,(Even), 59-65**
5.9Evaluating Definite Integrals by Substitution
** Add problems those are discussed in the class room

Attendance Policy

Attendance at all classes is mandatory and is a NSU policy. Students are expected to remain in class the *entire* period. This means that students must arrive on time and stay until class is finished. Three consecutive absents need an official clarification. If you are a probation student/retake, I would like to have you in 24 classes (20 present is Must).

Quizzes and Midterm Exams: Best Two out of Threequizzes will be considered.
There is no scope to retake the Mid-terms or Final exam. Exceptional cases*(unfortunate physical inability, serious illness) may be considered conditionally with proper justification.
Quiz days are: Lecs 5, 11, 15, 19, 21.**Mid1:**Day of Lecs9, **Mid2:**Day of Lecs 17.
Final Exam: Date will be declared by the Controller of Examinations.
Assignments: Submit assignments from all chaptersandrelated problems
beforeMidTerm I , MidTerm II and Final Exam.
Syllabus for : Mid-Term I (0.1 –2.6) ; Mid -Term II (3.1- 4.4) ;Term Final (All).