EAST WEST UNIVERSITY

Department of Mathematical and Physical Sciences

Course Outline for Spring 2020

Course Code:	Course Title:	Section:	Credits:
MAT101	Differential and Integral Calculus	8/11	3

Instructor: F. M. Arifur Rahman,
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Class Routine and Office Schedule:

Day / Time	*9:00-10:00*	*10:10-11:40*	*11:50-1:20*	*1:30-3:00*	*3:10-4:40*
(S) Sunday	*Office Hour*	*MAT101 (11) AB1-501*	*MAT101 (8) AB1-602*	*STA102 (5) AB1-402*	*Office Hour*
(M) Monday			*Office Hour*	*GEN225 (2) AB1-502*	
(T) Tuesday	*Office Hour*	*MAT101 (11) AB1-501*	*MAT101 (8) AB1-602*		
(W) Wednesday		*Office Hour*	*Office Hour*	*GEN225 (2) AB1-502*	*Office Hour*
(R) Thursday			*Office Hour*	*STA102 (5) AB1-402*	*Office Hour*

Course Description:

This course is an introductory course on differentiation and integration techniques. Differentiation and integration techniques are highly used in science & engineering subjects to understand the rate of changes of different scientific phenomena and to get measurements of any object in situations where simple subtraction and addition cannot be applied to get those information.

Course learning outcomes:

After completion of this course a student will be able to-

1. recognize properties of functions and their graphs;
2. understand the terms domain and range;
3. sketch graphs, using function, its first derivative, and the second derivative;
4. use the algebra of limits, and L'Hôpital's rule to determine limits of simple expressions;
5. use the basic rules of differentiation in order to find derivatives of products and quotients;
6. apply the procedures of differentiation accurately, including implicit and logarithmic differentiation;
7. find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves;
8. perform accurately definite and indefinite integration, using parts, substitution;
9. understand and apply the procedures for integrating rational functions;
10. perform accurately improper integrations;
11. understand the concept of gamma and beta functions;
12. calculate the area under a curve, the area between two curves, the volumes of solid objects, the length of arcs and the surface area.

Text Books:

1. Calculus Early Transcendentals. Howard Anton, IRL Bivens, Stephen Davis. 10th edition. John Wiley & Sons, Inc.
2. Calculus. James Stewart. 8th edition. Cengage Learning.

Reference Books:

1. Differential Calculus: Das & Mukherjee.
2. Integral Calculus: Das & Mukherjee.

Score Distribution:

Midterm-1	20%
Midterm-2	20%
Final	30%
Quiz	10%
Assignment	10%
Presentation	5%
Class Attendance	5%
Total	**100%**

Grading System:

Marks	Grade	Marks	Grade
97-100	A+ (4.00)	73-below 77	C+ (2.30)
90-below 97	A (4.00)	70- below 73	C (2.00)
87- below 90	A- (3.70)	67- below 70	C- (1.70)
83- below 87	B+ (3.30)	63-below 67	D+ (1.30)
80-below 83	B (3.00)	60- below 63	D (1.00)
77- below 80	B- (2.70)	Below 60	F (0.00)

Detailed Course Outline & lesson plan (approximate):

Week	Date	Topics	Remark
1	Jan 7	Functions & graphs	
2	Jan 12 & 14	Functions & graphs	
3	Jan 19	Functions & graphs	
4	Jan 26 & 28	Limit of a function	Quiz 1: Jan 26
5	Feb 2 & 4	Limit of a function Continuity	
		Mid Term I Examination (February 9, 2020 Sunday)	
6	Feb 11	Differentiation & Differentiability	
7	Feb 23, 25 & 27	Techniques of Differentiation Implicit Differentiation L'Hopitals Rule	
8	Mar 1 & 3	Increasing & Decreasing Functions, Concavity Relative Maxima and Minima	Quiz 2: Mar 1
9	Mar 8 & 10	Absolute Maxima and Minima Rolle's Theorem, Mean Value Theorem, Taylor Series, Euler's Theorem Partial Differentiation	
		Mid Term II Examination (March 15, 2020 Sunday)	
12	Mar 22 & 24	Integration, Antiderivative, Properties Techniques of Integration: method of u-substitution	
13	Mar 29 & 31	Techniques of Integration: integration by parts Finding Area & Volume	
14	Apr 5 & 7	Finding Area & Volume Improper Integral, Beta function and Gamma function	Quiz 3: Apr 5
		Final Examination (April 12, 2020 Sunday)	

Note:

- There are several assignments to be submitted and 1 presentation to be delivered by the students. Presentation date is 21 March 2020, Saturday.
- Monday, 10 February 2020 is earmarked for Mid Term I Exams for students who will have more than two exams on a single day as per the schedule above.
- Monday, 09 March 2020 is earmarked for Mid Term II Exams for students who will have more than two exams on a single day as per the schedule above.
- Monday, 13 April 2020 is earmarked for Final Exams for students who will have more than two exams on a single day as per the schedule above. The class teachers will collect the information from the students immediately who have more than two exams on a single day and report it to respective chairpersons for rescheduling these exams on Monday, 13 April 2020.

Ground rules:

1. Students must be present in at least 90% classes. Students are encouraged to be regular in their studies.
2. Zero tolerance for any type of cheating in exams.
3. No makeup for quizzes
4. Makeup for mid-exams will only be allowed for appropriate cases with supporting documents.
5. Student must bring scientific calculator and required course materials in classes.
6. Student must bring scientific calculator and required exam materials in exams.
7. Assignments are meant for practice and learning only. It is okay to have a wrong solution for a mathematical problem in an assignment. The important thing here is, students have to try their best to solve a problem, and this is what will carry the marks. Students are encouraged to consult with the course instructor or UTAs for understanding or explanation of a math solution. But any means of cheating (e.g. copying) in assignments will result in deduction of marks.

Important dates to remember

	Date	Day	Event
January	**January 06**	**Monday**	**First Day of Classes** **Payment** of tuition fees for **continuing students:** As per the Payment Schedule (06 January 2020 to 15 January 2020)
	January 08	Wednesday	Last day to Add Courses Last day to Drop Course(s)/Semester with 100% Refund
	January 14	Tuesday	Last day to clear Incomplete grades ("I" grade)
	January 15	Wednesday	Last date of **payment** of tuition fees **without late fee**
	January 20	Monday	Last day of Tuition Payment with Late Fee of Tk. 500/-
	January 23	Thursday	Last day of Tuition Payment with Late Fee of Tk. 1000/-
	January 27	Monday	**Suspension of classes on account of Convocation**
	January 28	Tuesday	19th Convocation (2020)
	January 29	Wednesday	**Holiday:** Saraswati Puja
February	February 02	Sunday	Last day to Drop Course(s)/Semester with 85% Refund
	February 04	**Tuesday**	**Blocking of ID Numbers of Defaulting Students**
	February 06-12	**Thursday-Wednesday**	**Mid Term I Examinations**
	February 20	Thursday	Last Day to Drop Course(s)/Semester with 50% Refund
	February 21	Friday	**Holiday:** Shaheed Day & International Mother Language Day
March	**March 05-11**	**Thursday-Wednesday**	**Mid Term II Examinations**
	March 15	Sunday	Regular Tuesday Classes
	March 17	Tuesday	**Holiday:** Birthday of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman
	March 19	Thursday	Last day of Withdrawal of Course(s)/Semester ("W" grade)
	March 26	Thursday	**Holiday:** Independence & National Day
	March 28-Apr 01	Saturday-Wednesday	Advising of Courses for Summer 2020 (ongoing students)
April	April 05	Sunday	**Last Day of Classes**
	April 08-16	**Wednesday-Thursday**	**Final Examinations** **(Wednesday, 15 April: Tuesday schedule will be followed)**
	April 09	Thursday	**Holiday:** Shab-E-Barat *****
	April 11	**Saturday**	**Admission Test for Summer 2020**
	April 14	Tuesday	**Holiday:** Bengali New Year's Day
	April 20	Monday	Submission of Final Grades
	April 22-27	Wednesday-Monday	Semester Break
	April 28	Tuesday	University Reopens for Summer 2020
	April 30	Thursday	Orientation for Summer 2020
	May 03	Sunday	First Day of Classes for Summer 2020