

SRI GURU TEGH BAHADUR KHALSA COLLEGE

University of Delhi-110007

Academic Calendar July-Dec 2016

Week	Dates	Days	Lecture Schedule	List of Holidays
1 st	20 th July - 23 rd July	4	Total Days: 100	Sem. Break: 11 th Oct.-16 th Oct
2 nd	25 th July - 30 th July	6	Holidays : 08	
3 rd	01 st Aug - 06 th Aug	6	Total Teaching Days: 92	Aug.15: Independence day
4 th	08 th Aug - 13 th Aug	6		Aug.25: Janmashtami
5 th	16 th Aug - 20 th Aug	5		Sep.13: Id-ul-Zuha
6 th	22 nd Aug - 27 th Aug	5		Oct. 02: Gandhi Jayanti
7 th	29 th Aug - 03 rd Sep	6		Oct. 11: Dussehra
8 th	05 th Sep - 10 th Sep	6		Oct. 12: Muharram
9 th	13 th Sep - 17 th Sep	5		Oct. 14: Guru Nanak B'Day
10 th	19 th Sep - 24 th Sep	6		Oct. 30: Diwali
11 th	26 th Sep - 01 st Oct	6		
12 th	03 rd Oct - 08 th Oct	6		
13 th	10 th Oct - 15 th Oct	1		
14 th	17 th Oct - 22 nd Oct	6		
15 th	24 th Oct - 29 th Oct	6		
16 th	31 st Oct - 05 th Nov	6		
17 th	07 th Nov - 12 th Nov	6		

Teacher's Name: Mr. Nikhil Khanna

Department: Mathematics

Course: GE

Semester: I

Paper: GE- I CALCULUS

Book Recommended: H. Anton, I. Bivens and S. Davis, Calculus, John Wiley and Sons Inc., 7/e (2011).

Lesson Plan

Week	Topic	Specific Topics for Lecture	Hours	Task for Tutorials	Test/Prsn
3 rd	ϵ - δ Definition of limit of a function	<ul style="list-style-type: none"> ➤ Limits (An Intuitive approach): examples ➤ Computing limits ➤ Computing limits (End Behaviour) ➤ Limits (ϵ-δ Definition) and examples 	05	Ex 2.1: 19-20 Ex 2.2: 20-26 Ex 2.3: 5-14 Ex 2.4: 9-18	
4 th	One sided limit, Limits at infinity, Horizontal asymptotes	<ul style="list-style-type: none"> ➤ One side limit: definition ➤ Limits at infinity: definition and examples ➤ Horizontal asymptotes: definition and examples 	05	Ex 2.3: 19-24 Ex 2.4: 37-52, 55-68	
5 th	Infinite limits, Vertical asymptotes, Linearization, Differential of a function	<ul style="list-style-type: none"> ➤ Infinite limits: definition with an informal view, formal definition and examples ➤ Vertical asymptotes: definition and examples ➤ Local linear approximation, error in local linear approximation ➤ Differentials and its formulas 	05	Ex 2.1: 32 Ex 3.8: 1-4, 13-16, 19-21, 33-38, 46-47	
6 th	Concavity, Points of inflection, Curve sketching	<ul style="list-style-type: none"> ➤ Concavity: definition and examples ➤ Inflection points: definition and examples ➤ Properties of graphs, procedure for analyzing graphs, analysis of polynomials, geometric implications of multiplicity, graphing rational functions, graphs with vertical tangents and cusps 	04	Ex 4.1: 23-28 Ex 4.3: 11-15, 27, 34	
7 th	Indeterminate forms, L'Hopital's rule, Volumes by slicing, Volumes of solids of revolution by the disk method	<ul style="list-style-type: none"> ➤ Indeterminate forms: Type $\frac{0}{0}, \frac{\infty}{\infty}, 0 \cdot \infty, \infty - \infty, 0^0, \infty^0, 1^\infty$ ➤ L'Hopital's rule: Theorem and formula ➤ Volumes by slicing: Volume formula ➤ Solids of revolution: Volumes by disks perpendicular to the x-axis 	05	Ex 7.7: 15-35 Ex 6.2: 8-12, 16-20	Test 1

Week	Topic	Specific Topics for Lecture	Teaching hours	Task for Tutorials	Test/ Prestrn
8 th	Volumes of solids of revolution by the washer method, Volume by cylindrical shells, Length of plane curves	<ul style="list-style-type: none"> ➤ Volumes by washers perpendicular to the x-axis ➤ Volumes by disks and washers perpendicular to the y-axis ➤ Volume by cylindrical shells ➤ Variations of the method of cylindrical shells ➤ Length of plane curve: Arc length problem, definition and examples, arc length of parametric curve, finding arc length by numerical methods 	05	Ex 6.2: 23-25, 27 Ex 6.3: 5-14 Ex 6.4: 3-12	
9 th	Area of surface of revolution, Improper integration: Type I and II	<ul style="list-style-type: none"> ➤ Surface area: definition, Surface Area Problem and examples ➤ Improper integrals: integrals over infinite intervals ➤ Type I improper integrals: definition and examples ➤ Type II improper integrals: definition and examples 	05	Ex 6.5 1-8 Ex 8.8 3-15, 31,32	
10 th	Tests of convergence and divergence, Polar coordinates, Graphing in polar coordinates	<ul style="list-style-type: none"> ➤ Tests for convergence and divergence: Direct comparison test, Limit comparison test and examples ➤ Polar coordinate system, relationship between polar and rectangular coordinates, symmetry tests and graphing 	05	Ex 8.8 16-30 Ex 11.1 3,4,9-12, 17-20	Test 2
11 th	Vector valued functions: Limit, Continuity, Derivatives, Integrals	<ul style="list-style-type: none"> ➤ Vector valued functions: Parametric curves in 3-space ➤ Limits and continuity: definition and examples ➤ Derivatives: definition, rules ➤ Tangent lines to graphs of vector valued functions ➤ Derivatives of dot and cross products ➤ Integral rules 	05	Ex 13.1 5-8 Ex 13.2 7,8, 11-14, 23,24,27,28, 33-35, 39,40- 42	Revision
12 th & 13 th	Arc length, Unit tangent vector, Curvature, Unit normal vector, Torsion, Unit binormal vector	<ul style="list-style-type: none"> ➤ Arc length: definition and examples ➤ Change of parameter ➤ Arc length parametrizations ➤ Unit normal vector, Torsion, Unit binormal vector, binormal vectors in 3-space 	05	Ex 13.3 7-12, 19, 23,25,37,40 Ex 13.4 3-10, 15-18 Ex 13.5 62	

Wee k	Topic	Specific Topics for Lecture	Teaching hours	Task for Tutorials	Test/ Prestn
14 th	Functions of several Variables, Graph, Level curves, Limit, Continuity	<ul style="list-style-type: none"> ➤ Functions of two or more variables: graphs ➤ Level curves: examples ➤ Limit along curves, limits of functions of two variables, properties ➤ Continuity: functions of two variables, continuity on a set and extensions to three variables 	05	Ex 14.1 28-34 Ex 14.2 17-22, 26,27	Assignment
15 th	Partial derivatives, Differentiability Chain Rule, Directional derivatives, Gradient	<ul style="list-style-type: none"> ➤ Partial derivatives of function of two or more than two variables ➤ Chain rule for derivatives and partial derivatives ➤ Directional derivatives Gradient: definition and examples 	05	Ex 14.3 4,5,19-22,41 Ex 14.5 7,11,12,19, 20,28,29 Ex 14.6 7,8,14,15,20, 21,35,36,39, 40,47,51,56	
16 th	Tangent plane and normal line, Extreme values, Saddle points	<ul style="list-style-type: none"> ➤ Tangent plane: definition, total differential, tangent planes to level surfaces, tangent lines to intersection of surfaces ➤ Maxima and minima of functions of two variables ➤ Extreme value theorem and saddle points, ➤ Finding relative extrema, finding absolute extrema on closed and bounded sets, 	05	Ex 14.7 15,16,19,22 Ex 14.8 9-20,35	
17 th	Revision	<ul style="list-style-type: none"> ➤ Important topic's revision 	05	Doubts	