

1. Lesson Plan
Mathematics IIB (BS-M202) 2019-20 even

SL No	Module	Lecture No	Topic Covered	Taxonomical Activity	Use of Special Resources
1.	0	1	DOUBLE INTEGRALS : Definition of double integral , Evaluation of Double integral by repeated integral , And their properties .	Overall description of the subject	Oral Communication/ Verbal mode
2	1	2	TRANSFORMATION OF DOUBLE INTEGRAL AND APPLICATION OF DOUBLE INTEGRALS : Changing order of integration , transformation of double integrals(<u>cartesian to polar</u>), application of double integrals(<u>find centre of gravity by double integrals</u>)	Revise, understand analyze and apply	Black Board & Chalk [BB&C]
3	1	3	TRIPLE INTEGRALS (CARTESIAN): Definition of triple integrals , evaluation of triple integral by repeated integral , finding volume in different planes .	Understand analyze and apply	BB&C
4	1	4	APPLICATION OF TRIPLE INTEGRALS : Find centroid of the solid region by triple integrals , Triple integrals involving rectangular parallelopiped ,and related problem.	Revise, understand, analyze, apply	BB&C
5	1	5	ORTHOGONAL CURVILINEAR CO-ORDINATES : Basic concept of orthogonal curvilinear co-ordinates , Gradient , Dievergence , curl in curvilinear co-ordinate	Understand, analyze, apply	BB&C
6	1	6	SIMPLE APPLICATIONS INVOLVING CUBES , SPHERE AND	Understand, analyze, apply	BB&C

			RECTANGULAR PARALLELOPIPEDS		
7	1	7	LINE INTEGRAL IN THE PLANE : Line integral in the plane and line integral in space ,scalar line integral ,vector line integral .	Understand, analyze, apply	BB&C
8	1	8	SURFACE INTEGRALS : Definition of surface integrals , illustrative example of surface area , Greens theorem in the plane(introduction)	Understand, analyze, apply	BB&C
9	1	9	GREENS THEOREM IN THE PLANE : Line integral into the double integral over a region bounded by closed curve(using Greens theorem),greens theorem in the plane in vector notation .	Understand, analyze, apply	BB&C
10	1	10	THE DIEVERGENCE THEOREM OF GAUSS : Using dievergence theorem transform volume integral into surface integral and illustrative examples .	Understand, analyze, apply	BB&C
11	1	11	STOKES THEOREM : By Stokes theorem, transform the line integral into the surface integral .application of Stokes theorem on div , curl , grad .	Understand, analyze, apply	BB&C
12	2	12	First order but not of 1st degree differential equation: problems solvable for y, problems solvable for x, problems solvable for p.	Understand, analyze, apply	BB&C
13	3	13	Clairaut's form and problems on this topic from previous years question papers.	Understand, analyze, apply	BB&C
14	3	14	Higher order linear differential equation with constant coefficient: Introduction and how to find out the complementary function	Understand, analyze, apply	BB&C
15	3	15	D operator methods for finding	Understand, analyze, apply	BB&C

			P.I(RHS=sinx,cosx,e ^x ,polynomials)		
16	3	16	D operator methods for finding P.I(RHS=product form)	Understand, analyze, apply	BB&C
17	3	17	D operator methods for finding P.I(RHS=product form, if the denominator becomes 0)	Understand, analyze, apply	BB&C
18	3	18	Cauchy-Euler equations	Understand, analyze, apply	BB&C
19	4	19	Method of variation of parameters	Understand, analyze, apply	BB&C
20	3	20	First order and 1st degree differential equation: Exact equations, Necessary and sufficient condition of exactness (statement only) and some problems on this topic.		
21	3	21	Rules of finding integrating factors and problem solving on related topic.	Understand, analyze, apply	BB&C
22	3	22	Linear equation and Bernoulli's equation , some problems from semester question papers.	Understand, analyze, apply	BB&C
23	3	23	Solution of simultaneous linear differential equations	Understand, analyze, apply	BB&C
24		24	Power series solutions	Understand, analyze, apply	BB&C
25		25	Legendre polynomials and related problems	Understand, analyze, apply	BB&C
26		26	Bessel functions of the first kind and related problems	Understand, analyze, apply	BB&C
27		27	Related problem solving on power series solutions, Legendre polynomials and Bessel functions	Understand, analyze, apply	BB&C
28		28	Differentiation of complex functions, Cauchy-Riemann equations	Understand, analyze, apply	BB&C

29		29	Harmonic functions, determination of harmonic conjugate	Understand, analyze, apply	BB&C
30		30	Elementary analytic functions (exponential, trigonometric, logarithmic) and their properties	Understand, analyze, apply	BB&C
31		31	Conformal Mappings	Understand, analyze, apply	BB&C
32		32	Mobius transformations and their properties	Understand, analyze, apply	BB&C
33		33	Contour integrals,Cauchy-Goursat theorem,Cauchy integral formula	Understand, analyze, apply	BB&C
34	5	34	Liouville's theorem and maximum-modulus theorem	Understand, analyze, apply	BB&C
35	5	35	Taylor's series, zeros of analytical functions, singularities and related problems	Understand, analyze, apply	BB&C
36	5	36	Laurent's series, residues and related problems	Understand, analyze, apply	BB&C
37	5	37	Cauchy residue theorem, evaluation of definite integral involving sine and cosine	Understand, analyze, apply	BB&C
38	5	38	Cauchy residue theorem, evaluation of definite integral involving sine and cosine	Understand, analyze, apply	BB&C
39	5	39	Evaluation of certain improper integrals using the Bromwich contour	Understand, analyze, apply	BB&C
40	5	40	Evaluation of certain improper integrals using the Bromwich contour	Understand, analyze, apply	BB&C