

TEACHING PLAN -2022(ODD SEMESTER)
WOMEN'S COLLEGE, TINSUKIA

• **Name of the Faculty: Dr. Bandita Phukan**

• **Department : Mathematics**

Semester: B.A. 5th Semester (Honours)			Total No. of Students: 01	
Paper Name: Number Theory			Paper Code: DSE-2	
Allotted Hour(s)of Lecture: (72+18) Hours			Actual Hour(s): (72+18) Hours	
Sl. No.	Class	Topics (As per University Syllabus)	Hrs.	Remarks/Books
Unit – I				
1	1 & 2	Linear Diophantine equation	2	<i>Elementary Number Theory</i> By D. M. Burton <i>A first course in Number theory</i> By K. C. Choudhury
2	3,4& 5	prime counting function	3	
3	6 &7	statement of prime number theorem	2	
4	8, 9 & 10	Goldbach conjecture	3	
5	11,12,13& 14	linear congruences	4	
6	15,16,17& 18	complete set of residues	4	
7	19,20,21, &22	Chinese Remainder theorem	4	
8	23,24&25	Fermat's Little theorem	3	
9	26,27&28	Wilson's theorem	3	
10	29,30	Review/Remedial class	2	
Unit – II				
11	31 & 32	Number theoretic functions	2	<i>Elementary Number Theory</i>
12	33,34 & 35	sum and number of divisors	3	
13	36,37 & 38	totally multiplicative functions	3	

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14	39,40&41	definition and properties of the Dirichlet product	3	By D. M. Burton <i>A first course in Number theory</i> By K. C. Choudhury
15	42,43& 44	The Mobius Inversion formula	3	
16	45, 46 &47	The greatest integer function	3	
17	48,49 & 50	Euler's phi- function	3	
18	51,52 & 53	Euler's theorem	3	
19	54, 55& 56	reduced set of residues	3	
20	57,58&59	some properties of Euler's phi-function	3	
21	60	Review/Remedial class	1	
UNIT III				
22	61 & 62	Order of an integer modulo n	2	<i>Elementary Number Theory</i> By D. M. Burton <i>A first course in Number theory</i> By K. C. Choudhury
23	63 & 64	Primitive roots for primes	2	
24	65,66 & 67	Composite numbers having primitive roots	3	
25	68	Euler's criterion	1	
26	69&70	The Legendre symbol and its properties	2	
27	71,72, 73&74	Quadratic reciprocity	4	
28	75,76,77&78	Quadratic congruences with composite moduli	4	
29	79,80&81	Public key encryption	3	
30	82,83&84	RSA encryption and decryption	3	
31	85 &86	The equation $x^2 + y^2 = z^2$	2	
32	87,88&89	Fermat's Last theorem	3	
33	90	Review/Remedial class	1	

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Semester: B.A. 3 rd Semester (Honours)		Total No. of Students: 03		
Paper Name: PDE and Systems of ODE		Paper Code: C.3.3		
Allotted Hour(s) of Lecture: (60+30) Hours		Actual Hour(s): (60+30) Hours		
Sl. No.	Class	Topics (As per University Syllabus)	Hrs.	Remarks/Books
Unit – I				
1	1,2 &3	Partial Differential Equations – Basic concepts and Definitions, Mathematical Problems.	3	<i>Elements of Partial Differential Equations</i> By I. N. Sneddon <i>Partial Differential Equation for Scientists and Engineers,</i> by T. Myint-U and LokenathDebnath,
2	4,5,6 &7	First- Order Equations: Classification, Construction and Geometrical Interpretation.	4	
3	8 &9	Method of Characteristics for obtaining General Solution of Quasi Linear Equations.	2	
4	10	Non-linear partial differential equations	1	
5	11,12,13& 14	Charpit's method	4	
6	15,16 &17	Jacobi's method	3	
7	18,19,20 &21	Canonical Forms of First-order Linear Equations.	4	
8	22,23 &24	Method of Separation of Variables for solving first order partial differential equations.	3	
9	25	Review/Remedial class	1	
Unit – II				
10	26 & 27	Classifications of second order linear equations as hyperbolic, parabolic or elliptic.	2	<i>Differential equations</i> By S.L. Ross (Chapter 14.1,14.3)
11	28	Derivations of Heat equation,	1	
12	29	Derivations of Wave equation	1	

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13	30	Derivations of Laplace equation	1	
14	31 & 32	Solutions of Heat equation, Wave equation and Laplace equation	2	
15	33 & 34	Reduction of second order Linear Equations to canonical forms.	2	
16	35	Review/Remedial class	1	
Unit – III				
17	36, 37& 38	Method of separation of variables,	3	<i>Advanced Partial Differential Equations</i> by M. D. Raisinghanian
18	39, 40 &41	Solving the Vibrating String Problem,	3	
19	42, 43& 44	Solving the Heat Conduction problem	3	
20	45	Review/Remedial class	1	
Unit – IV				
21	46	Systems of linear differential equations, types of linear systems	1	<i>Differential equations</i> By S.L. Ross (Chapter 7.1 –7.4; 8.3,8.4)
22	47	differential operators	1	
23	48 & 49	an operator method for linear systems with constant coefficients	2	
24	50 & 51	Basic Theory of linear systems in normal form	2	
25	52 & 53	homogeneous linear systems with constant coefficients: Two Equations in two unknown functions	2	
26	54	The method of successive approximations	1	
27	55 & 56	Euler method	2	
28	57	Modified Euler method	1	
29	58& 59	The Runge-Kutta method upto fourth order approximation.	2	
30	60	Review/Remedial class	1	

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Practical				
31	46	Solution of Cauchy problem for first order PDE.	5	
32	47	Finding the characteristics for the first order PDE	6	
33	48 & 49	Plot the integral surfaces of a given first order PDE with initial data.	6	
34	50 & 51	Solution of the wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for some associated conditions.	7	
35	52 & 53	Solution of wave equation $\frac{\partial u}{\partial t} - k^2 \frac{\partial^2 u}{\partial x^2} = 0$ for some associated conditions.	6	

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• **Name of the Faculty: Dr. Bandita Phukan**

• **Department : Mathematics**

Semester: B.A. 1st Semester			Total No. of Students: 02	
Paper Name: Differential Calculus			Paper Code: GE:1.1	
Allotted Hour(s) of Lecture: (24+6) Hours			Actual Hour(s): (24+6) Hours	
Sl. No.	Class	Topics (As per University Syllabus)	Hrs.	Remarks/Books
Unit – I				
1	1,2 &3	Limit and Continuity (ϵ and δ definition)	4	<i>Calculus</i> by H. Anton, I. Birens and S. Davis
2	4,5,6 &7	Types of discontinuities	4	
3	8 &9	Differentiability of functions	4	
4	10	Successive differentiation	4	
5	11,12,13& 14	Leibnitz's theorem	4	
6	15,16 &17	Partial differentiation	5	
7	18,19,20 &21	Euler's theorem on homogeneous functions.	4	
8	22	Review/Remedial class	1	