Title	**Syllabus Distribution (CBCS)**
Session	**2019-20 (Even Semester)**
Department	**B.Sc General in Mathematics**
Institution Name	**Hiralal Bhakat College, Nalhati, Birbhum, W.B.**
Coordinator	**Dr. Banshidhar Sahoo, Assistant Professor in Mathematics**

Details of Courses of B.Sc. General under CBCS

Sl.	Course	Credit		Marks
1.	Core Course (12 Papers) 4 core papers each in 3 disciplines of choice	Theory+Practical 12×(4+2)=72	Theory+Tuitorial 12×(5+1)=72	12×75=900
2.	Elective Course DSE (6 Papers)	6×(4+2)=36	6×(5+1)=36	6×75=450
3	Ability Enhancement Core Course (AECC) AECC-1 (ENVS) AECC-2 (English/MIL)	 4×1=4 2×1=2	 4×1=4 2×1=2	 100 50
4.	SEC (4 Papers)	4×2=8	4×2=8	4×50=200
	Total Credit:	122	122	1700

B.Sc. Mathematics General Course Structure

Semester	Course Course (CC)	Discipline Specific Elective (DSE)	Ability Enhancement Course	
			AECC (2)	SEC (4)
I	CC1A (Mathematics) CC2A (Physics) CC3A (Computer Sc.)		AECC-1	
II	CC1B (Mathematics) CC2B (Physics) CC3B (Computer Sc.)		AECC-2	
III	CC1C (Mathematics) CC2C (Physics) CC3C (Computer Sc.)			SEC-1 (Mathematics) or SEC-1 (Computer Sc.)
IV	CC1D (Mathematics) CC2D (Physics) CC3D (Computer Sc.)			SEC-2 (Mathematics) or SEC-2 (Computer Sc.)
V		DSE1A (Mathematics) DSE2A (Physics) DSE3A (Computer Sc.)		SEC-3 (Mathematics) or SEC-3 (Physics)
VI		DSE1B (Mathematics) DSE2B (Physics) DSE3B (Computer Sc.)		SEC-4 (Mathematics) or SEC-4 (Physics)

Semester-II

Core Course (CC 1B): Differential Equation (Marks: 75)

Syllabus	Number of Lecture	Name of Teacher
First order exact differential equations, Integrating factor. First order higher degree equation. Solvable for x, y, p. Methods for solving higher-differential equations. Basic Theory of differential equations. Wronskian and its Properties.	**20 L**	**Dr. Banshidhar Sahoo**
Linear homogeneous equations with constant coefficients. Linear non-homogeneous equations. Methods of variable of parameters. Cauchy-Euler equation. Simultaneous differential equation.	**16 L**	
Order and degree of partial differential equations. Concept of linear and non-linear partial differential equations. Formation of first order partial differential equations. Linear partial differential equation of first order. Lagrange's method. Charpit's method.	**15 L**	
Classification of second order partial differential equations into elliptic, parabolic and hyperbolic through illustration only.	**9 L**	

Reference book:

1. **S.L. Ross: Differential Equation, 3rd Ed., John Wiley and Sons, 1984**
2. **I. Sneddon: Elements of Partial Differential equations, McGraw-Hill, International Edition, 1967.**
3. **M.D. Raisinghania: Ordinary and Partial Differential Equation, S. Chand (20th Edition).**
4. **J.G. Chakraborty and P.R.Ghosh: Differential Equation, U.N. Dhur & Sons Pvt. Ltd.**

Semester-IV

Core Course (CC 1D): Algebra (Marks: 75)

Syllabus	Number of Lecture	Name of Teacher
Definition and examples of Groups, examples of abelian and non-abelian groups, the group Z_n of integer under addition modulo n and the group U9n) of units under multiplication module n. cyclic groups from number systems, complex roots of unity, circle group, the general lineargroup $GL_n(n, R)$, groups of symmetric of 9i) an isosceles triangle, (ii) an equilateral triangle, (iii) a rectangle, and (iv) a square, the permutation group Sym (n), Group of quaternions.	**20 L**	**Dr. Banshidhar Sahoo**
Subgroups, cyclic subgroup, the concept of a subgroup generated by a subset and the commutator subgroup of group, examples of subgroups including the centre of a group. Cosets. Index of subgroup. Lagrange's theorem, order of an element. Normal subgroups; their defintions and properties. Quotient group.	**20 L**	
Definition and example of rings, examples of commuitative and non-commutative rings: rings from number systems, Z_n, the ring of integers modulo n, ring of real quaternions, ring of matrices, polynomial rings and rings of continuous functions. Subrings and ideals. Integral domain and fields, examples of fields. Field of rational functions.	**20 L**	

Reference Books:

1. **J.B. Fraleigh: A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.**
2. **M. Martin: Abstract Algebra, 2nd Ed., Pearson, 2011.**
3. **S.K.Mapa: Higher Algebra (Abstract & Linear), Levant Books.**
4. **D.R. Finston and P.J. Morandi: Abstract Algebra, Birkhauser Verlag AG.**

Skill Enhancement Course (SEC 2): Vector Calculus (Marks 50)

Syllabus	Number of Lecture	Name of Teacher
Differentiation and partial differentiation of a vector function. Derivative of sum, dot product and cross product of two vectors.	**20 L**	**Dr. Banshidhar Sahoo**
Gradient, divergent and Curl.	**20 L**	

Reference books:

1. **P.C. Mathew's: Vector Calculus, Springer Verlag London Limited, 1998.**
2. **S. Narayan and P.K. Mittal: Vector Calculus, S. Chand.**

Head
Department of Mathematics
Hiralal Bhakat College
Naihati, Birbhum

HIRALAL BHAKAT COLLEGE * NAIHATI, BIRBHUM * Estd-1986 W.B

Teacher-in-Charge
Hiralal Bhakat College
Naihati, Birbhum