

**Rajarshi Shahu Mahavidyalaya (Autonomous), Latur**  
**Department of Mathematics**  
**Academic Year : 2020-2021**  
**Term - First (June,2020 - Nov.,2020)**

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Name of Assistant Professor : Miss Ashwini Balajirao Kale

Subject : Mathematics

**1. Details of Classes to be taught**

Sr. No.	Class	Course Name	Course Code	(Theory / Practical)
1	U.G-I	Algebra-I	U-MAT-138	Theory
2.	U.G-I	Statistical Methods	U-STM-702	Theory
3.	U.G-II	Group Theory	U-MAT-340	Theory
4.	P.G-I	Theory of Probability	P-COA-167	Theory
5.	P.G-II	Classical Mechanics	P-LAB-169	Lab Work-I

**2. Summary of Lesson Plan for U.G-I**

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit I Elementary number theory</b>	09/0/2020 to 21/11/2020	24	Classroom Seminar	Assignment 1
2.	<b>Unit II Complex Numbers</b>	26/11/2020 to 31/12/2020	16	Classroom Seminar	Assignment 2
3.	<b>Unit III Rank of Matrix and Linear Equations</b>	0/01/2020 to 15/02/2020	18	Classroom Seminar	Assignment 3

### 3. Summary of Lesson Plan for U.G-I

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit I</b> Module-I	05/10/2020 to 04/12/2020	24	Classroom Seminar	
2.	<b>Unit II</b> Module-II	05/12/2020 to 31/12/2020	16		Assignment 1
3.	<b>Unit III</b> Module III	02/01/2021 to 04/02/2021	18	Classroom Seminar	
4.	<b>Unit IV</b> Module-IV	05/02/2021 to 13/02/2021	10		Assignment 2

### 4. Summary of Lesson Plan for U.G-II

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit-I : Groups and Sub-group</b> Definition of group, subgroups, Elementary properties of groups, finite groups, cyclic groups and its properties.	16/07/2020 to 21/08/2020	17		
2.	<b>Unit- II Permutation groups and isomorphism</b> Symmetric groups, Permutations, Group isomorphism, Automorphism and their properties, Cayleys theorem,	27/08/2020 to 12/10/2020	19	Classroom Seminar	Assignment 1
3.	<b>Unit-III Coset and Lagrange's theorem</b> Definition of coset and properties, Lagrange's theorem and its consequences, an applications of cosets to permutation groups. External direct product, definition and examples of normal subgroups and factor groups.	13/10/2019 to 15/12/2020	22	Classroom Seminar	Assignment 2

### 5. Summary of Lesson Plan for P.G-I

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit I:</b> Basic Definitions, Mathematical and statistical probability, Subjective Probability, Axiomatic approach to probability, Theorems on probability, Conditional probability, Multiplication theorem of probability of independent events, Examples, Extended axiom of axiom of addition and axiom of continuity, Baye's theorem.	02/01/2021 to 30/01/2021	22	Classroom Seminar, Workshop on "Women's Empowerment in STEM " on 07/01/2021	Assignment 1
2.	<b>Unit II:</b> Random variables, Types , Probability function of discrete random variable,Continuous random variable, Probability density function, Mathematical expectation, Properties of expectation, Variance, Properties of Variance, Moment generating function, Properties of Moment generating function, Cumulants and its propertie	01/02/2021 to 27/02/2021	20	Classroom Seminar, Guest Lecture on 17/0/2021 on the topic "Online Earning with Chegg as QA Expert"	Assignment 2
3.	<b>Unit III:</b> Discrete Probability distributions, Binomial distribution, Mean and Variance of binomial distribution, MGF and CGF of Binomial distribution, Fitting of binomial distribution, Poisson distribution, Mean and variance of Poisson distribution, MGF and CGF of Poisson distribution, Fitting of Poisson distribution,	02/03/2021 to 05/04/2021	20	Classroom Seminar	Assignment 3
4.	<b>Unit IV:</b> Normal distribution, Properties of normal distribution, Moments of normal distribution, MGF and CGF and fitting of normal distribution.	06/04/2021 to 30/04/2021	20	Classroom Seminar	Assignment 3

#### 4. Summary of Lesson Plan for P.G-II

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>UNIT I:</b> Mechanical of system of particles, Mechanics of system of particles, Conservation theorems conservative forces with examples, Constraints, Generalized co-ordinates. D. Alembert's principle, Lagrange's equations of motion. The forms of Lagrange's equations of motion for non conservative systems and partially conservative and partially non conservative systems. Kinetic energy as a homogeneous function of generalized velocities. Simple applications of the Lagrangian formulation.	16/07/2020 to 21/08/2020	20	Classroom Seminars	
2.	<b>UNIT II :</b> Cyclic co-ordinates and generalized momentum conservation Theorems, Calculus of variation, Euler Lagrange's equation, First integrals of Euler Lagrange's equation, the case of several dependent variables, Geodesics in a plane, the minimum surface of revolution, Brachistochrome problem. Isoperimetric problems, problems of maximum enclosed area.	24/08/2020 to 12/09/2020	20	Classroom Seminars	Assignment 1
3.	<b>UNIT III:</b> Hamiltonian function, Hamilton's canonical equations of motion, Derivation of Hamilton's equations from variational principle, Physical significance of Hamiltonian, the principle of least action, Jacobi's form of the least action principle, cyclic co-ordinates and Routh's procedure.	14/09/2020 to 12/10/2020	23	Classroom Seminars	Assignment 2
4.	<b>UNIT IV:</b> The independent co-ordinates of a rigid body, Orthogonal transformations, Properties of transformation matrix, Infinitesimal rotations, The Eulerian angles, The Cayley-Klein parameters, Eulers theorem on motion of rigid body, Angular momentum and kinetic energy of motion of a rigid body about a point.	13/10/2020 to 04/12/2020	26	Classroom Seminars	

Teaching Staff

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**Rajarshi Shahu Mahavidyalaya (Autonomous), Latur**  
**Department of Mathematics**  
**Academic Year : 2020-2021**  
**Term - Second (Feb,2021 - May,2021)**

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**Name of Assistant Professor :** Miss Ashwini Balajirao Kale

**Subject :** Mathematics

**1. Details of Classes to be taught**

Sr. No.	Class	Course Name	Course Code	(Theory / Practical)
1	U.G-I	Geometry-I	U-MAT-239	Theory
3.	U.G-II	Ring Theory	U-MAT-340	Theory
4.	U.G-III	Complex Analysis		Theory
5.	P.G-II	Field Theory	P-FIT-464	Theory

**2. Summary of Lesson Plan for U.G-I**

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit II: The Plane and Right Line</b> The plane: First degree equation, converse, transformation to normal form, plane ,under given condition,Right line,coplanar lines, number of constants in equation of line, Shortest distance.	15/03/2021 to 19/04/2021	20	Classroom Seminar	Assignment 1
2.	<b>Unit III: Sphere, Cones and Cylinder</b> The sphere: Equation of a sphere, general equation, plane section of sphere, intersection of two sphere, sphere with given diameter,Cones and Cylinders: Cone, equation of cone, right circular cone and equation,Cylinder and its equation.	20/04/2021 to 07/06/2021	15	Classroom Seminar	Assignment 2

### 3. Summary of Lesson Plan for U.G-II

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit I:</b> Definition and examples of rings, some special classes of rings, Homeomorphisms, Isomorphism	25/02/2021 to 27/0/2021	15	Classroom Seminar	
2.	<b>Unit II:</b> Ideals and quotients rings, More ideals and quotients rings, the field of quotients of an integral domains .	01/04/2021 to 03/05/2021	15		Assignment 1
3.	<b>Unit III:</b> Euclidean rings, A particular Euclidean ring (Ring of Gaussian Integers), Polynomial rings, Polynomial over the rational fields.	07/05/2021 to 29/05/2021	15	Classroom Seminar	Assignment 2

### 4. Summary of Lesson Plan for U.G-III

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit I</b> Functions of Complex Variable, C-R Equations	25/02/2021 to 27/03/2021	15	Classroom Seminar	Assignment 1
2.	<b>Unit III</b> Integrals, Cauchy's Integral equation	01/04/2021 to 03/05/2021	15	Classroom Seminar	Assignment 2
3.	<b>Unit III</b> Singularities and the Calculus of residues	07/05/2021 to 29/05/2021	15	Classroom Seminar	Assignment 3

### 5. Summary of Lesson Plan for P.G-II

Sr.No.	Unit to be covered	Date	No.of Lectures	Academic activities to be organized	No.of Test / Assignment with topic and date
1.	<b>Unit-I Introduction</b> Definition and examples of fields, Minimal polynomial, adjoining elements, irreducible polynomial, The Schoneman-Eisenstein criterion,	22/2/2021 to 10/03/2021	20		Assinment 1
2.	<b>Unit-II:Fields Extension</b> Prime radicals, the degree of extension, Finite Extensions, The Tower theorem, Algebraic extension	12/03/2021 to 05/04/2021	20	Classroom seminars	Assignment 2
3.	<b>Unit-III: Normal And Separable extension</b> Splitting fields Definition and examples, Uniqueness of splitting fields, Normal extensions, Separable extension, Fields of characteristic zero, Fields of characteristic $p$ , Theorem of primitive element.	06/04/2021 to 24/04/2021	21	Classroom seminars	Assinment 3
4.	<b>Unit-IV: The Galois Group</b> Definition of the Galois Group, Galois group of splitting fields, Permutations of the roots, The Universal Extension, a polynomial of degree 5.	26/04/2021 to 13/05/2021	16	Classroom seminars	Surprise Test

Teaching Staff

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