

Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Mathematics

Structured Work Plan for Teaching

13/07/2020 to 15/12/2020

1. Details of Classes to be taught

| Sr. No. | Class | Name of Teacher | Subject | Paper |
|---------|------------------|-----------------|-------------|--|
| 1 | B.Sc-III (Sem-V) | Mahesh S Wavare | Mathematics | Linear Algebra -X |
| 2 | B.Sc-II(Sem-III) | | | SEC on R software -I |
| 3 | M.Sc-II(Sem-III) | | | Coding Theory –I-XI |
| 4 | M.Sc-II(Sem-III) | | | Research Project of allocated M.Sc -II year students |
| 5 | M.Sc-I (Sem-I) | | | Ordinary Differential Equation -III |
| 6 | M.Sc-I (Sem-I) | | | Seminar of Allocated students |
| 7 | M.Sc-II(Sem-III) | | | Seminar of Allocated students |
| | | | | |

2. Summary of Lesson Plan of U-MAT -556 (Paper X) Linear Algebra (Theory and Practicla)

Name of Teacher: Mahesh S Wavare

Class

: B.Sc.III (FifthSemester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|---|------------|-----------------|-------------------------------------|--|
| 1 | Maths | Unit I: Properties of Vector operations in R^n , Euclidean N Space. Norm and distance in n-space, Vector Space definition, examples and simple properties. Subspace, solution space of homogeneous systems, Linear Combination of vectors, linear span of Vectors. Linear dependence and independence, Basis and Dimension .Coordinate to basis, Row space, column space and null space (only statements), Rank-nullity for Matrices | 13/07/2020 | 8 | Guest Lecture | Assignment on Unit I |
| | | | To | 8 | | |
| | | | 10/09/2020 | 7 | | |
| 2 | | Unit II: Definition and Examples, Length and distance in inner product space, properties. Cauchy-Schwarz inequality, Properties of Length and distances in inner product space, Angle between | 12/09/2020 | 8 | Surprise test | Assignment on Unit II |

| | | | | | | |
|---|--|---|--|---------------------|---------------|-------------------|
| | | vectors, orthogonality, Orthogonal and orthonormal bases, co-ordinate relative to orthogonal and orthonormal bases, Gram-Schmidt methods | 20/10/2020 | 7 | | |
| 3 | | Unit III: Definition and Example of Linear transformations, properties, Kernel and range of Linear Transformation. Dimension theorem of Linear Transformation. Linear Transformation from R^n to R^m , Linear Transformation from images of basis vectors, All Linear transformations are matrix transformation, Standard matrices of linear transformations. | 21/10/2020 To 30/11/2020 | 6 3 3 | Guest lecture | Homework Examples |

3. Summary of Lesson Plan of Skill enhancement course on R Software -I (Theory)

Name of Teacher: Mahesh S Wavare

Class : B. Sc. II (Third Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|--|--------------------------------|----------------------|-------------------------------------|--|
| 1 | Maths | Section-I Skill- I Basic fundamentals, installation and use of software, data editing, use of R as a calculator, functions and assignments. Use of R as a calculator, functions and matrix operations, missing data and logical operators. | 16/07/2020 To 14/08/2020 | 03 04 04 04 | Showing NPTEL video lectures | Assignment of NPTEL |
| 2 | | Section-II Skill-II Conditional executions and loops, data management with sequences. Data management with repeats, sorting, ordering, and lists | 16/08/2020 To 19/09/2020 | 04 04 07 | Showing NPTEL video lectures | Assignment of NPTEL |


4. Summary of Lesson Plan of Coding Theory –II P-COT-364(A)


Name of Teacher: Mahesh S Wavare

Class : M.Sc. II (Third Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|---|--------------------------------|-----------------|-------------------------------------|--|
| 1 | Maths | Unit I: Error detection, correction and decoding introduction, Communication channels, Maximum likelihood decoding, Hamming distance, nearest neighbor / minimum distance, decoding distance of a code. | 13/07/2020 To 30/07/2020 | 15 | Guest Lecture | Assignment as preparation of PPT |
| 2 | | Unit II: Fields polynomials rings structure of finite fields, minimal polynomials vector spaces over finite fields | 31/07/2020 to 20/08/2020 | 15 | Seminar by students | Unit Test -I |
| 3 | | Unit –III Linear codes , Hamming weight bases for linear codes , Generator matrix and parity check matrix, Equivalence of linear codes , Encoding with linear codes , Decoding of | 21/08/2020 to 15/09/2020 | 15 | | Assignment solve |

| | | | | | | |
|---|--|---|--------------------------------|----|---------------|-------------------|
| | | linear codes, Cosets nearest neighbor ,decoding for linear codes syndrome decoding | | | | |
| 4 | | Unit-IV The main coding theory problem lower bounds sphere covering bound Gilber- Varshamav bound hamming bounds and perfect codes, Binary Hamming codes, q-ray Hamming codes | 16/09/2020 to 24/10/2020 | 15 | Guest lecture | Homework Examples |


Sign of Teaching Staff
(M . S. Wavare)


Head
(M . S. Wavare)
Head,
Department of Mathematics,
Rajarshi Shahu Mahavidyalaya,
(Autonomous) Latur-413512




Principal
PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Mathematics

Structured Work Plan for Teaching

(01/01/2021 to 15/05/2021)

1. Details of Classes to be taught

| Sr. No. | Class | Name of Asstt. Prof. | Subject | Paper |
|---------|------------------|----------------------|-------------|---|
| 1 | B.Sc-I (Sem-II) | Dr. Mahesh S. Wavare | Mathematics | Integral Calculus-IV Unit -III |
| 2 | B.Sc-III(Sem-VI) | | | Theory of Probability and Distributions -XII |
| 3 | M.Sc-II(Sem-IV) | | | Coding Theory –II |
| 4 | M.Sc-II(Sem-IV) | | | Seminar of Allocated students |
| 5 | B.SC-III(Sem-VI) | | | Research Project of allocated B.Sc -III year students |
| 6 | M.Sc-II(Sem-IV) | | | Research Project of allocated M.Sc -II year students |
| | | | | |
| | | | | |

2. Summary of Lesson Plan of U-MAT -238 (Paper IV) Integral Calculus-IV (Unit-III)

Name of Teacher: Mahesh S Wavare

Class

: B.Sc I (Second Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|--|--------------------------------|----------------------|-------------------------------------|--|
| 1 | Maths | Unit III Beta functions, convergence of Beta functions, properties of beta function, Gamma function, convergence of gamma functions, recurrence formula for gamma function ,relation between beta and gamma functions(only statements), and duplication formula . | 10/03/2021 to 15/05/2021 | 03 03 03 03 | Guest Lecture | Home Assignments |

3. Summary of Lesson Plan of Theory of Probability and Distributions-XII

Name of Teacher: Mahesh S Wavare

Class : B.Sc.III (Sixth Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|--|--------------------------------|----------------------|-------------------------------------|--|
| 1 | Maths | Unit-I Basic Definitions, Mathematical and statistical probability, Axiomatic approach to probability, Theorems on probability, Conditional probability with examples, Extended axiom of addition and continuity, Baye's theorem. | 22.02.2021 To 20/03/2021 | 03 03 03 03 | Guest Lecture | Home Assignments |
| 2 | | Unit-II Random variables, Types - discrete random variable, Continuous random variable, probability distribution function, probability density function, Mathematical expectation, Properties of expectation and Variance, Moment generating function, Cumulant generating function, Probability generating function, and its properties. | 21.03.2021 To 10/04/2021 | 04 04 04 04 | | Unit Test I |
| 3 | | Unit-III Discrete Probability distributions: Binomial distribution, Poisson distribution, Discrete Uniform distribution, Hypergeometric distribution; its Mean and Variance; | 11.04.2021 To | 03 04 | | Home Assignments |

| | | | | | | |
|--|--|---|------------|----------------|--|--|
| | | MGF and CGF of distributions, Fitting of distributions and its applications. Continuous Probability distributions: Normal distribution, Exponential distribution, its properties, Moments and applications. | 15/05/2021 | 03 02 04 | | |
|--|--|---|------------|----------------|--|--|

4. Summary of Lesson Plan of Coding Theory –II P-COT-467(A)

Name of Teacher: Mahesh S Wavare

Class : M.Sc. II (Fourth Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|---|--|------------------------|-------------------------------------|--|
| 1 | Maths | Unit I: Goley code some remarks on perfect codes singleton bounds and MDS codes, Plotain bound, nonlinear codes , Hadmand matrix code, Nordstrom-Robinson code , preparata codes. | 22/02/2021 To 10/03/2021 | 04 04 04 | Guest Lecture | Assignment Questions |

| | | | | | | |
|---|--|---|--------------------------------|----------------------|---------------|---------------------------------------|
| 2 | | Unit II: Construction of Linear codes, propagation Reed-Muller codes, Subfield codes | 11/03/2021 to 31/03/2021 | 12 | Guest Lecture | Activity Examples for Unit Test -I |
| 3 | | Unit-III Definition of cyclic codes, generator polynomial, Generator and parity check matrices, Decoding of cyclic codes, Burst error correcting codes. | 01/04/2021 to 20/04/2021 | 06 06 06 | | Home Assignments |
| 4 | | Unit-IV B.C.H codes, definitions, Parameters of B.C.H codes, Decoding of B.C.H codes, Reed Solomon codes, Quadratic residue code, Generalised Reed – Solomon codes | 21/04/2021 to 15/05/2021 | 05 05 04 04 | | Homework Examples |

Sign of Teaching Staff

(M . S. Wavare)

Head

(M . S. Wavare)

Principal

4. Summary of Lesson Plan of Ordinary Differential Equation


Name of Teacher: Mahesh S Wavare


Class : M.Sc. I (First Semester)

| Sr. No. | Subject | Unit and Chapter to be covered | Date | No. of Lectures | Academic activities to be organized | No. of Test / Assignment with topic and date |
|---------|---------|---|------------------------------------|-----------------|-------------------------------------|--|
| 1 | Maths | Unit I: Initial value problems, Solutions of the homogeneous equation. | 01/01/2021 To 24.01.2021 | 15 | Guest Lecture | Assignment Questions |
| 2 | | Unit II: Linear dependence and independence, A formula for the Wronskian, The non-homogeneous equations of order two, The homogeneous equations of order n , Initial Value Problem for n th order equations, Equations with real constants, The non-homogeneous equations of order- n , A special method for solving the non-homogeneous equation, Algebra of | 21/01/2021 to 20/02/2021 | 20 | Guest Lecture | Activity Examples for Unit Test -I |

| | | | | | | |
|---|--|---|--------------------------------|----|--|-------------------|
| | | constant coefficient operators. | | | | |
| 3 | | Unit –III Wronskian and linear independence, Reduction of order, Non-homogeneous equations, Legendre equation, Linear Equations with regular singular points: Euler equation, Second order equation with regular singular points, Exceptional cases, The Bessel equation, The Bessel equation (Continued). | 22/02/2021 to 15/03/2021 | 15 | | Home Assignments |
| 4 | | Unit-IV Separation of variables, Exact equations, Method of successive approximations, Lipchitz condition, Convergence of the successive approximations, Non local | 16/03/2021 to 31/03/2021 | 12 | | Homework Examples |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | existence of solutions, Approximations to, and uniqueness of solutions, Equations with complex valued functions. | | | | |
|--|--|--|--|--|--|--|


Sign of Teaching Staff
(M . S. Wavare)


Head,
Department of Mathematics,
Rajarshi Shahu Mahavidyalaya
(Autonomous) Latur-413512




Principal
PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)