Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Structured Work Plan for Teaching

(July 2018 to Nov 2018)

First Term

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

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	B.Sc.III Sem-V	D.M.Ghuge	Mathematics	Linear Algebra
2	M.Sc.I Sem-I			ODE

2. **Summary of Lesson Plan**

Name of Teacher:D.M.Ghuge   Class   : B.Sc.III (Sem-V)

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	Mathematics	**Unit I:** Properties of Vector operations in n R , Euclidean N Space. Norm and distance in n-space, Vector Space definition, examples and simple properties. Subspace, solution space of homogeneous systems, Linear	02-07-2018 To 30-07-2018	15	workshop Classroom Seminar	

		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 (only statements)				Assignment of topics first before 31 Aug 2018
		Unit-II Inner Product Space [15 Lectures] 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 vectors, orthogonality, Orthogonal and orthonormal bases, co-ordinate relative to orthogonal and orthonormal bases, Gram-Schmidt methods (Examples only)	01-08-2018 To 31-08-2018	15		
		Unit-III Linear Transformation [15 Lectures] Definition and Example of Linear transformations, properties, Kernel				

		and range of linear transformation .Dimension theorem of Linear Transformation .Linear Transformation from n R to m R ,Linear Transformation from images of basis vectors ,All Linear transformations are matrix transformation, Standard matrices of linear transformations.	01-09-2018 To 3-10-2018	15		

3. Summary of Lesson Plan

Name of Teacher: D.M.Ghuge   **Class**   **: M.Sc.I (Sem-I) ODE**

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	Mathematics	**Unit-I:**Linear equations of first order, Initial Value Problem for second order equations: Initial value problems, Solutions of the homogeneous equation.	09-07-2018 To 19-07-20158	15	NPTEL online courses

workshop | Assignment of topics first before 31 Aug 2018 |

		Unit-II Linear Equations with constant coefficients: 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 nth order equations, Equations with real constants, The non-homogeneous equations of order-n, A special method for solving the non-homogeneous equation, Algebra of constant coefficient operators.	20-07-2018 To 13-08-2018	15	Classroom Seminar
		Unit-III: Linear equations with variable coefficients: Wronskian and linear independence, Reduction of order, Non-homogeneous equations,	14-08-2018 To 03-09-2018	15	

		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) **Unit-IV:**Existence and uniqueness of solutions to first order equations: Separation of variables, Exact equations, Method of successive approximations, Lipchitz condition, Convergence of the successive approximations, Non local existence of solutions, Approximations to, and uniqueness of solutions, Equations with complex valued functions	04-09-2018 To 03-10-2018	15	

Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Structured Work Plan for Teaching

(Dec 2018 to March 2019)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	B.Sc.II			Ordinary Differential Equations
2	B.Sc.II	D.M.Ghuge	Mathematics	Practicals
3	M.Sc.I			Linear Algebra
4	M.Sc.II			Practicals

2. Summary of Lesson Plan

Name of Teacher: D.M.Ghuge   Class   : B.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	Mathematics	Unit I: Definitions and Formation of Differential Equation Preliminaries: Ordinary and partial differential equations order and degree, Solutions and constants of integration, The derivation of differential equation.	29 Nov 18 To 20 Dec 18	02 02 02	workshop Classroom Seminar	Surprice test on 24 dec 2018

Solutions, general, particular, singular, Equations of the First order and of the First Degree.	02		
Unit II: Linear Differential equations With constant coefficient			
Linear equations,	01		
The complementary function,	02		
the particular Integral, the complete integral.	03		
The linear equation with constant coefficient and second member zero.	24 Dec 2018		
Case of the auxiliary equation having equal roots, imaginary roots,	04 Feb 2019 To 04 02		
The symbol D, Theorem concerning D.	02		
The linear equation with constant coefficient and second member is a function of x,	02		
The symbolic function $\dfrac{1}{f(D)}$	02		Assignment of topics first before 31 Dec 2018
Method of finding the Particular integral			
Unit III: Linear Differential equations with variable coefficients			

	No. of Lectures
The Homogeneous linear equation. First method of solution , Second method of Solution to find the Complementary function, particular integral. The symbolic functions 2019	04
$f(\theta)$ and $\frac{1}{f(\theta)}$ .Method for finding particular integral. 05 Feb To 19 Mar 2019	04
Integral corresponding to a term of form x^α in the second member,	04
Equations reducible to the homogeneous linear form,	03
Orthogonal Trajectories Equation of the second order	02

3. **Summary of Lesson Plan**

Name of Teacher: D.M.Ghuge   Class   : M.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	Mathematics	Unit-I:				
		Introduction, Vector spaces,	29 Nov 18	04 04	NPTEL online courses	Surprice test on 19 dec 2018

Topic	Date	No.	Method	Remarks
subspaces, Quotient Spaces,				
Linear combinations and system of linear equations,	To 19 Dec 18	02	workshop	Tutorial classes
linear dependence and independence,		02		
Bases and dimension, Maximal Linear Independent Subsets.		01	Seminar	
Unit-II			Classroom	
Linear Transformations, Null spaces,	20 Dec 2018	02		
Ranges, The matrix representation of a linear transformation,	To 09 Jan 2019	03		Surprice test on 09 jan 2019
Composition of linear transformations, Invertibility and		02		
Isomorphism,		02		
The change of Co-ordinate matrix,		04		
Dual spaces.		02		
Unit-III:	10 Jan 2019			Surprice test on 31 Jan 2019
Elementary Matrix Operations and	To	02		

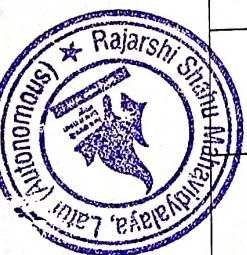| Content	Date	No.	Remark
elementary matrices,	31 Jan 2019	02	
The rank of a matrix, System of linear equations-Theoretical Aspects, System		03	
of linear equations-Computational		04	
Aspects, Eigen values and Eigen		02	
vectors, Diagonalizability, Triangulable			
Operators, Invariant Subspaces,		02	
Cayley-Hamilton Theorem.			
Unit-IV:			
Inner products and Norms, The Gram-	01 Feb 2019	02	Surprice test on
Schmidt Orthogonalization process	To	04	27 Feb 2019
and orthogonal complements, the	26 Feb	03	
adjoint of a linear operator, Bilinear	2019	02	
forms, Quadratic forms. Jordan		02	
Canonical form-I, Jordan Canonical		01	
form-II, The Minimal Polynomial,		02	
Rational Canonical form.		01	