

**Rajarshi Shahu Mahavidyalaya, Latur**

**(Autonomous)**

**Structured Work Plan for Teaching**

**First Term**

**(June 2018 to Oct 2018)**

- Details of Classes to be taught

Sr. No.	Class	Name of Faculty	Subject	Paper
1.	B.Sc. III	Pimple N.S.	Mathematics	Metric Spaces (T)
2.	M.Sc. I			Problems in Metric spaces (P)
3.	M.Sc. II			Complex Analysis (T)
				Functional Analysis (T)

- Summary of Lesson Plan

Name of Teacher: Pimple N.S.

Class: - B.Sc. III

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 (Metric Spaces)	Unit I Metric Space, Introduction, Metric, Neighborhood, Limit Point, Isolated Point, Closed Set, Boundary Sets, Interior point, Interior, Open Set.	27 June 2018 To 18 Jul 2019	14	Assignments NPTEL Course registration Madhava Quiz Competition	Unit Test-1

		<b>Unit-II</b> Cauchy Sequence, Complete Metric spaces, Baire category Theorem, Compactness & Connectedness.	<b>23 Jul 2018 to 04 Sept 2018</b>	<b>15</b>	<b>Ramanujan Quiz Competition</b> <b>IIT-JAM Entrance preparation</b>  <b>Seminars</b> <b>Poster Presentation</b>	<b>Unit Test-2</b>
		<b>Unit-III</b> Weierstrass Theorem, Sequentially Compactness, Totally boundedness, Lebesgue number, Lebesgue Covering lemma, Continuity and Uniform Continuity.	<b>05 Sept 2018 to 03 Oct 2018</b>	<b>16</b>		

#### Summary of Lesson Plan

Name of Teacher: Pimple N.S.

Class: M.Sc. I

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 (Complex Analysis)	<b>Unit I Complex Variables:</b> Complex Field, Modulus, Argument and Conjugate of complex numbers, Algebra of complex numbers, Rectangular and Polar representation of Complex numbers, Point sets in the plane, Sequences.	<b>26 July 2018 To 11 Aug 2018</b>	<b>15</b>	<b>Assignments</b> <b>NPTEL Course registration</b>	
		<b>Unit II Basic Mappings:</b> Stereographic Projection, Linear Fractional, Transformation, Other Mappings, The Exponential Function, Mapping Properties, The	<b>13 Aug 2018 to 1 Sept 2018</b>	<b>18</b>	<b>Seminars</b>	<b>Unit Test -1</b>

		Logarithmic Function, Complex Exponents.				
		<b>Unit III Cauchy–Riemann Equation:</b> Analyticity, Harmonic Functions, Sequences of Functions, Uniform Convergence, Maclaurin and Taylor Series, Operations on Power series.	<b>3 Sept 2018 to 21 Sept 2018</b>	<b>17</b>	<b>Poster Presentation</b>	
		<b>Unit IV Cauchy’s Integration:</b> Curves, Parameterizations, Line Integrals, Cauchy’s Theorems.	<b>22 Sept 2018 to 03 Oct 2018</b>	<b>10</b>	<b>Guest lecture</b>	<b>Unit Test -2</b>

#### Summary of Lesson Plan

Name of Teacher: Pimple N.S.


Class: M.Sc. II

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.	<b>Mathematics (Functional Analysis)</b>	<b>Unit-I:</b> Definition and some Examples of Banach Spaces, continuous linear transformations, The Hahn-Banach Theorem, The Natural embedding of $N$ in $N^{**}$ .	<b>27 June 2018 to 14 July 2018</b>	<b>15</b>	<b>Assignments NPTEL Course registration</b>	
		<b>Unit-II:</b> The open Mapping Theorem, The conjugate of an operator. The definition and some simple properties of Hilbert Spaces, orthogonal complements, orthonormal sets.	<b>16 July 2018 to 01 Aug 2018</b>	<b>15</b>	<b>Seminars</b>	<b>Unit Test -1</b>

		<b>Unit-III:</b> The conjugate space $H^*$ , The adjoint of an operator, self-adjoint operators, Normal and Unitary Operators, projections.	02 Aug 2018 to 21 Aug 2018	15	Poster Presentation	
		<b>Unit-IV:</b> Finite Dimensional Spectral Theory: Introduction, Matrices, Determinants and spectrum of an operator. The spectral Theorem.	23 Aug 2018 to 12 Sept 2018	15	Guest lecture	Unit Test -2
4.	M.Sc. I, II	Seminar & project	July 2018 to Oct 2020	40	2 students per week for seminar and six students for project	2- project Presentations for each group

Signature of Staff

  
Pimple N.S.

  
M.S. Waware

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

  
**PRINCIPAL**  
Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)



**Rajarshi Shahu Mahavidyalaya, Latur**

**( Autonomous )**

**Structured Work Plan for Teaching**

**Second Term**

**(December 2018 to March 2019)**

**Details of Classes to be taught**

Sr. No.	Class	Name of Faculty	Subject	Paper
1.	B.Sc. III	Pimple N.S.	Mathematics	Complex Analysis-XI (T)
2.	B.Sc. III			Complex Analysis-II (X-A) (P)
3.	M.Sc. II			Linear Integral Equations (XVI) (T)
4.	M.Sc. I			Partial Differential Equations (T)



## Name of Teacher: Pimple N.S.

**Class : B.Sc. III**

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 (U-MAT-645 Complex Analysis-XI)	<b>Unit-I</b> Derivatives of functions definite integrals of functions contours, contour integrals Examples upper bounds for moduli of contour integrals anti-derivatives examples Cauchy-Goursat's Theorem Simply and multiply connected domains. Cauchy integral formula Derivatives of analytic functions Liouville's Theorem Fundamental Theorem of Algebra  <b>Unit-II</b> Convergence of sequences Convergence of series Taylor Series Examples Laurent Series Examples Absolute and uniform convergence of power series Continuity of sums of power series Integration and Differentiation of power series	3 Dec 2018 To 7 Jan 2019  8 Jan 2019 to 13 Feb 2019		Assignments NPTEL Course registration Madhava Quiz Competition Ramanujan Quiz Competition IIT-JAM Entrance preparation  Seminars Poster Presentation	Unit Test – 1

	<b>Unit-III</b> Residues Cauchy residue theorem using a single residue three types of isolated singular points residues at poles zeros of analytic functions zeros and poles Applications of Residues Evaluation of improper integrals examples	<b>18 Feb 2019</b> to <b>27 Mar 2019</b>			<b>Unit Test - 2</b>
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### Summary of Lesson Plan

Name of Teacher: Pimple N.S.

Class : M.Sc. I

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 (P-COA-268(A) Complex Analysis-II)	<b>Unit -I</b> Power series, Analytic functions, Branch of a logarithm, Mobius(Bilinear) Transformations and Conformal Mappings Power Series representation of analytic functions, Taylor's Theorem, Cauchy's Estimate, Zeros of an analytic function, Louville's Theorem, Fundamental Theorem of Algebra, Maximum Modulus Theorem.	29 Nov 2018 To 31 Dec 2019	20	Assignments NPTEL Course registration GATE/SET/NET Entrance preparation	
		<b>Unit -II</b> Index of a closed curve, Cauchy's Theorem, Cauchy's Integral Formula, Higher Order derivatives, Morera's	1 Jan 2019 to 22 Jan 2019	15		<b>Unit Test - 1</b>

<p>Theorem, The Homotopic version of Cauchy's Theorem and simple connectivity, Counting of Zeros, The Open mapping Theorem, Goursat's theorem.</p> <p><b>Unit -III</b> Singularities, Classification of Singularities, Laurent's Series, Casorati-Weierstrass Theorem, Residues, Cauchy's Residue Theorem, Evaluation of Integrals, Meromorphic functions, The Argument Principle, Rouché's Theorem, Schwartz Lemma.</p> <p><b>Unit -IV</b> Convex Functions and Hadamard's three Circles Theorem, The Space of continuous Functions, Spaces of Analytic Functions, The Riemann mapping Theorem.</p>	<p>23 Jan 2019 to 15 Feb 2019</p>	<p>15</p>	<p>Seminars Poster Presentation</p>	<p>Unit Test - 2</p>
<p>16 Feb 2019 to 09 Mar 2019</p>	<p>10</p>			



# Summary of Lesson Plan

Name of Teacher: Pimle N.S.

Class : M.Sc. II

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 (P-LIE- 465 Linear Integral Equations)	Unit-I Definition and classification of integral equations Special kinds of kernels Convolution integrals Conversion of an initial value problem into a Volterra integral equation Conversion of a boundary value problem into a Fredholm integral equation Eigen values and eigen functions Solution of homogeneous Fredholm integral equations of the second kind with separable kernel Fredholm alternative  Unit-II Method of successive approximation Iterated kernel Resolvent kernel Solution of Fredholm and Volterra integral equations of the second kind by the method of successive substitutions Solution of Fredholm and Volterra integral equations of the second kind by the method of successive approximations; Neumann series	01 Dec 2018 To 22 Dec 2018	15	Assignments NPTEL Course registration GATE/SET/NET Entrance preparation  Seminars Poster Presentation	Test-1

<b>Unit-III</b> Integral equations with symmetric kernels Regularity conditions Complex Hilbert space An orthonormal system of functions Fundamental properties of eigen values and eigen functions for symmetric kernels Expansion in eigen functions and bilinear form Hilbert-Schmidt theorem and some immediate consequences Singular integral equations The Abel integral equation examples	21 Jan 2019 to 18 Feb 2019	20	Test-2
<b>Unit-IV</b> Integral transform method Application of Laplace transform to solve Volterra integral equations with convolution type kernels Application of Fourier transform to solve integral equations Examples	20 Feb 2019 to 09 Mar 2019	10	

Signature of Staff

Pimple N.S.

HoD

M. S. Wavare

**Principal**  
Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)

