

**RAYAT SHIKSHAN SANSTHA'S
MAHATAM PHULE A.S.C. COLLEGE, PANVEL**

DEPARTMENT OF MATHEMATICS

**DIPLOMA COURSE
IN
APPLIED MATHEMATICS**

CLASS: S.Y.B.Sc

RayatShikshanSanstha's
Mahatma Phule Arts, Science and Commerce College, Panvel, Dist. Raigad. 410206
DEPARTMENT OF MATHEMATICS
Short Term Course
"DIPLOMA COURSE IN APPLIED MATHEMATICS"

Duration: 3 Months

Hours: 60

Course Co-ordinator: Mr. Vaibhav Bharat Jagzap

INTRODUCTION:

Applied mathematics is a branch of Mathematics consists of mathematical methods by different fields like science, engineering, business, computer science and industry. The term applied mathematics also describes the professional speciality in which real life practical problems are solved by formulating & studying mathematical models. Thus in this course student will be able to grasp some of the basic mathematical & numerical methods to formulate, analyse, study & solve various problems.

OBJECTIVES:

At the end of this short term course, student will be able to

- Acquire a clear perspective of the nature & scope of applied mathematics and understanding of some mathematical concepts.
- Recognize when, why and how the transform, specific techniques and general principles.
- Evaluate tedious integrals and differential equations in the easiest way that is used in engineering and technology and many other fields.
- Know the relationship between the Integral Equations and Ordinary Differential Equations.
- Calculate the future value of an ordinary annuity.
- Calculate the amount of interest earned in an ordinary annuity.
- Calculate the total contributions to an ordinary annuity.
- Calculate monthly payments that will produce a given future value

SYLLABUS

THEORY:

Sr. No.	Unit	Topic	Faculty	No. of Lectures
1.	Unit I	Laplace Transformation	Mr. Jagzap V. B.	10
2.	Unit II	Fourier Series	Mr. Jagzap V. B.	10
3.	Unit III	Linear integral equations	Mr. Jagzap V. B.	10
4.	Unit IV	Interest and Annuity	Mrs. Deshmane N. V.	10

○ **Unit I : Laplace Transformation**

Definition of Laplace transformation, Laplace transformation of Standard Functions, Properties of Laplace Transformation, Inverse Laplace transforms, Properties of Inverse Laplace transforms, Convolution theorem, Laplace transform of Derivatives, Solution of Differential Equation using Laplace transform.

○ **Unit II : Fourier Series**

Definition of Fourier series, Series Expansion of Continuous Functions in the intervals $(0, 2l)$, $(-l, l)$, $(0, 2\pi)$, $(-\pi, \pi)$, Series Expansion of Even and Odd Functions, Half Range Series.

○ **Unit III : Linear integral equations**

Volterra integral equations, Fredholm integral equations, Some basic identities, Types of kernels: Symmetric kernel, Separable kernel, Iterated kernel, resolvent kernel, Initial value problems reduced to Volterra integral equations, Solution of Volterra integral equation.

○ **Unit IV : Interest and Annuity**

Simple Interest, Compound Interest, Calculations involving upto 4 times periods, Annuity Immediate and its Present value, Future value, Equated Monthly Installments using reducing balance method and amortization of loan, Stated Annual Rate and Affective Annual Rate Perpetuity and its present value.

PRACTICAL:

Units	Topics	No. of Lectures
Unit I	Examples of Laplace transforms, Inverse Laplace transforms, Convolution theorem, Differential Equations using Laplace transform	05
Unit II	Examples of Fourier Series, Series Expansion of Continuous Functions in the intervals $(0, 2l)$, $(-l, l)$, $(0, 2\pi)$, $(-\pi, \pi)$, Series Expansion of Even and Odd Functions, Half Range Series.	05
Unit III	Examples of Volterra integral equations, Fredholm integral equations, Kernel, Initial value problems reduced to Volterra integral equations, Solution of Volterra integral equation	05
Unit IV	Simple Interest, Compound Interest, Annuity Immediate and its Present value, Future value, Equated Monthly Installments, Stated Annual Rate, and Affective Annual Rate Perpetuity and its present value.	05

Reference Books:

1. Applied Mathematics, Nirali Prakashan.
2. Kanwal, R.P. Linear Integral Equation. Theory and Techniques. Academic Press, 2014.
3. Raisinghania M. D. Integral Equation & Boundary Value Problem. S. Chand Publishing, 2007.
4. Numerical and Statistical Methods, Sheth Publication.

Job Opportunities :

1. Students will able to understand the network analysis, study topology of networks in computer language.
1. Students can use it in the electrical circuit/network diagrams & problems.
2. For NET/SET Exam preparation.

Board Of Studies :

1. Mr. Jagzap Vaibhav B.
2. Mrs. Deshmane Nirmla V.