UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN CHEMISTRY

SYLLABUS WITH EFFECT FROM 2023-2024

<table>
<tr><td colspan="2">Title of the Course</td><td colspan="6">MATHEMATICS – II
(Common to B.Sc-Physics, Physics with CA, Computer Science, ECS, Data Science, Artificial Intelligence, Software Applications & BCA)</td></tr>
<tr><td colspan="2">Paper Number</td><td colspan="6">ELECTIVE COURSE II</td></tr>
<tr><td rowspan="2">Category</td><td rowspan="2">Elective</td><td>Year</td><td>I</td><td rowspan="2">Credits</td><td rowspan="2">3</td><td rowspan="2">Course Code</td><td rowspan="2">124E2A</td></tr>
<tr><td>Semester</td><td>II</td></tr>
<tr><td colspan="2" rowspan="2">Instructional Hours per week</td><td colspan="2">Lecture</td><td colspan="2">Tutorial</td><td>Lab Practice</td><td>Total</td></tr>
<tr><td colspan="2">4</td><td colspan="2">1</td><td>--</td><td>5</td></tr>
<tr><td colspan="2">Pre-requisite</td><td colspan="6">12th Standard Mathematics</td></tr>
<tr><td colspan="2">Objectives of the Course</td><td colspan="6">• Students gain some knowledge in Integral Calculus, Differential Equations.
• They also learn the basic concepts in Laplace Transforms and Vector Calculus</td></tr>
<tr><td colspan="2" rowspan="5"></td><td colspan="6">Unit I: Integral calculus: Bernouli's Formula, Reduction Formula
$Sin^n\theta$, $Cos^n\theta$, $Sin^m\theta\ Cos^n\theta$ – Simple Problems. Hours: 15</td></tr>
<tr><td colspan="6">Unit II : Fourier Series: Fourier series for functions $(0, 2\pi), (-\pi, \pi)$
Chapter 4: Section : 4.1, 4.1.1 Hours: 15</td></tr>
<tr><td colspan="6">Unit III: Differential Equations: Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form ay" +by'+ cy = X where X is of the form cos and sin - Related problems only.
Partial Differential Equations: Formation, complete integrals and general integrals, fourstandard types and solving Lagrange's linear equation P p +Q q= R.
Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4 Hours: 15</td></tr>
<tr><td colspan="6">Unit IV: Laplace Transforms: Laplace transformations of standard functions and simple properties, inverseLaplace transforms.
Chapter 7: Section 7.1.1 to 7.1.4 & 7.2 to 7.2.3 Hours: 15</td></tr>
<tr><td colspan="6">Unit V: Vector Differentiation: Introduction, Scalar point functions, Vector point functions, vector differential operator Gradient, Divergence, Curl, Solenoidal, irrotational, identities.
Chapter 8, Section 8.1 to 8.4.4 Hours: 15</td></tr>
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Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	**Total Hours: 75** Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Text	Allied Mathematics, Volume II by P. Duraipandian and S.Udayabaskaran, S. Chand Publications
Reference Books	1. Ancillary Mathematics by S. Narayanan and T.K. ManickavachagomPillay, S. Viswanathan Pinters, 1986, Chennai 2. Allied Mathematics by A. Singaravelu 3. Allied Mathematics by P.R. Vittal
Website and e-Learning Source	1. http://www.themathpaage.com 2. http://nptel.ac.in

Course Learning Outcome (for Mapping with POs and PSOs)

Students will be able to

CLO 1: Understand the various concepts of Bernoulli's and Reduction Formula.

CLO 2: Understand the concepts of Fourier Series

CLO 3: Understand the concepts of Non-Homogenous and Partial Differential Equations

CLO 4: Understand the Laplace Transforms

CLO 5: Understand the concepts of Vector Differentiation.

	Pos						PSOs		
	1	2	3	4	5	6	1	2	3
CLO 1	1	3	2	3	1	1	3	1	1
CLO 2	2	3	1	3	1	1	3	1	1
CLO 3	3	2	1	3	1	1	3	1	1
CLO 4	2	3	1	3	1	1	3	1	1
CLO 5	3	3	2	3	1	1	3	1	1