Course Code EC 2	**ALLIEDMATHEMATICS -II**		**Credits 3**
Year & Semester: **I YEAR & II SEMESTER** **<u>B.Sc. Physics / Chemistry</u>**	**Course Category**	**ELECTIVE**	**Total:(L+T+P) Perweek: 3+1= 4**

Course Objectives

<u>Objectives:</u>

- This course is designed for the students to expose the to pics such as expansions of trigonometric functions, partial differential equations,and integration.
- To gain knowledge of expansions of trigonometric functions.
- To acquire the knowledge of solving partial differential equations.
- Basic knowledge of vector calculus.
- To understand and carryout the calculations of a given set of data.

UNIT	Details	No. of Hours
I	**Vector Calculus:** Introduction about Vector Calculus – Gradient, Divergence and curl (probl only). Integration of vectors: Integration of vector functions, Line integral Surface integrals – Green's theorem in the plane (statement only) – Ga Divergence theorem (statement only) – Problems – Stoke's theorem (staten only) – Problems **Text Book 1**	**12**
II	**Partial differential equation** Introduction of Partial differential equation from differential equations - Forma of Partial differential equations by eliminating arbitrary constants and arbit functions* – Solutions of standard types of first order equations- f (p, q) = 0, f(x, p, q)=0, f(y, p, q)=0, f(z, p, q)=0, $f_1(x, p)= f_2(y, q)$, z = px+q (p, q) , Clairaut's form– Lagrange method of solving linear partial differer equations P p + Q q = R. (problems only) **Text Book 2**	**12**
III	**Total differential equations:** Introduction of total differential equations - Bessel's equations: Bessel's equati Solutions of Bessel's general differential equations (derivations not includ General solution of Bessel's equations - Recurrence formulae (derivation included) – Simple problems using Recurrence relation. **Text Book 1**	**12**

IV	**Laplace Transforms:** Introduction of Laplace Transforms- Definition – Laplace Transform of e^{at}, cos a sin at, cosh at, sinh at, t^n,n,apositiveinteger –$e^{at}f(t)$,$t^nf(t)$,$f'(t)$,$f''(t)$ InverseLaplaceTransformofstandard functions – Solving differential equations Second order with constant coefficients using Laplace Transform. **Text Book 3**	**12**
V	**Fourier Series:** Introduction of Fourier Series: Definition- Dirchlet's conditions- Fourier series of periodicity 2π and 2l - Odd and even functions –Root mean square value of a function Half range series: Introduction- Half range series –Cosin series- sin series – Parseval's theorem - Harmonic analysis. **Text Book 2**	**12**
	Total	**60**

Course Outcomes

CO	Understand the I and II integrals
1	Understand properties of integrals, Laplace transform.
2	Understand first order differential equations.
3	Analysis Theorems and proves.
4	Evaluate the importance of shifting properties.

Text Book

1	**P.Kandasamy and K.Thilagavathy**. "Mathematics for B. Sc., Br. -I, Volume-II and Volume-III", S.Chand & Company Ltd, First edition, 2004.
2	**S.Narayanan and T.K. Manickavasagam Pillai**," Calculus Vol. III ", S.Viswanathan (Printers and Publishers, (P)Ltd, Chennai, 2010.
3	**S. Narayanan and T. K. Manickavasagam Pillai**, "Calculus Vol. III " S.Viswanathan (Printers and Publishers, (P)Ltd, Chennai, 1997.

References Book

1 .**P. Kandasamy and K.Thilagavathy**, "Mathematics, Vol Iv", S.Chand And Company Ltd.,- 2004

1. **Shanti Narayan**, "Differential Calculus", Shyamlal Charitable Trust, New Delhi,2004.
2. **P.N.Chatterji**,"Vector Calculus ", 1st Edition, Rajhans Prakahan Publishers, Chennai,1998.

Web Resources

1.	https://ocw.mit.edu/courses/mathematics/18-336-numerical-methods-for-partial-differential-equations-spring-2009/
2.	https://www.mathworks.com

Course Outcome:

On the successful course completion, students will be able to:		Cognitive Level
CO1	Find out the approximate roots of polynomial equations.	K1
CO2	Develop the skills of finding roots of simultaneous equations	K1,K2
CO3	Demonstrate knowledge about matrices and their applications	K2,K3
CO4	Carryout calculations of problems related to curvature and radius of curvature.	K4
CO5	Evaluate double and triple Integrals, and enabled to underst and the Applications of integration in real-life situations.	K4, K5

K1- Remember; K2- Understand; K3-Apply; K4- Analyse; K5- Evaluate; K6- Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	M	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	M	M	S	S	M	S	M	M
CO4	S	M	M	S	M	M	S	S	M	M
CO5	M	S	S	M	S	M	S	M	M	S

*S-Strong; M-Medium; L-Low