MATHEMATICAL SCIENCES

G. Britto Antony Xavier

V. Balaji

S.U. Vasantha Kumar

B. Govindan

SHC MS 2e

JAYALAKSHMI PUBLICATIONS

Second Edition 2015

MATHEMATICAL SCIENCES

G. Britto Antony Xavier
V. Balaji
S.U. Vasantha Kumar
B. Govindan

JAYALAKSHMI PUBLICATIONS
Second Edition 2015

Contents

EXPONENTIAL AND LOGARITHMIC SERIES
THEORY OF EQUATIONS
TRIGONOMETRY
MATRICES
DIFFERENTIAL CALCULUS
INTEGRAL CALCULUS
FIRST ORDER HIGHER DEGREE DIFFERENTIAL EQUATIONS
SECOND ORDER DIFFERENTIAL EQUATIONS
PARTIAL DIFFERENTIAL EQUATIONS
LAPLACE TRANSFORMS
FOURIER SERIES
DIFFERENTIATION OF VECTORS
INTEGRATION OF VECTORS

ISBN 978-81-924922-4-7

₹ 350\-

Year/Semester: I Yr /I SEM **Code: AM114B**
Credits: 4 **Hours/Week: 6**

Allied Mathematics – I (Chemistry)

Objective: To make the students become familiar with the tools in Mathematics to solve problems in different related fields.

Unit – I: Theory of Equations
Formation of equations – Relation between roots and coefficients – Diminishing the roots of equations – Removal of terms – Reciprocal equation – Descarte's rule of signs – Horner's method – Newton's method.
(Chapter 2: Pages: 27 – 70)

Unit – II: Trigonometry
Expansion of sine and cosine – Powers of sine and cosine – Hyperbolic functions – Relation among hyperbolic functions – Inverse hyperbolic functions – Logarithm of complex numbers.
(Chapter 3: Pages 71 – 100).

Unit – III: Matrices
Determinant of a matrix – Characteristic equation of a matrix – Characteristic vectors of a matrix – Cayley-Hamilton theorem – Inverse of a matrix – Diagonalization of a matrix.
(Chapter 4: Pages: 106 - 166).

Unit – IV: Differential Calculus
Radius of curvature – Radius of curvature in polar coordinates – Radius of curvature in p-r equation – Co-ordinate of the centre of curvature.
(Chapter 5: Pages: 167 – 202)

Unit – V: Multiple Integrals
Double integrals – Double integral in polar coordinates – Triple integrals.
(Chapter 6: Pages 203 – 222)

Books for Study

1. G. Britto Antony Xavier, V. Balaji, S.U. Vasantha Kumar, B. Govindan, Mathematical Sciences , Jayalakshmi Publications, Second Edition, 2015

Books for Reference

1. S. Narayanan, R. Hanumantha Rao and T.K. Manicavachagom Pillai, Ancillary Mathematics, Volume – I, S. Viswanathan printers, Chennai, 2011.
2. S. Narayanan, P. Kandhasamy, R. Hanumantha Rao and T.K. Manicavachagom Pillai, Ancillary Mathematics, Volume– II, S. Viswanathan printers, Chennai, 2010.
3. P. Balasubramaniyam, K. G. Subramanian, Ancillary Mathematics, Volume – I, Tata McGraw – Hill publishing company limited, New Delhi, 1996.
4. P. Durai Pandian, S. Udaya Baskaran, Allied Mathematics, Volume – I, Muhil publishers, 1st Edition, Chennai, 1997.
5. P. Kandsamy and K. Thilagavathy, Allied Mathematics Volume – I, Volume – II, S. Chand & Company, New Delhi, 2004.
6. Shanti Narayan, P.K. Mittal, Differential Calculus, S.Chand& Co, New Delhi, 2005.
7. A. Singaravelu, Allied Mathematics, Meenakshi Agency, Chennai, 2001.
8. P.R. Vittal, Allied Mathematics, Margham Publications, Chennai, 1999.

E-Learning source: http://mathforum.org/library/drmath/sets/elem_2d

Course Learning Outcomes:

This course will enable the students to:

CO Number	CO Statement	Knowledge Level
CO1	illustrate theory of equations and find the roots of the equations applying Honor's method and Newton's method.	K3, K5
CO2	understand the concept hyperbolic and inverse hyperbolic functions.	K2
CO3	define diagonalization of a matrix.	K1
CO4	point out the radius of curvature and center of curvature	K4
CO5	facilitate double and triple integrals.	K6

Mapping of CO with PO and PSO

CO	Programme Outcomes (PO)	Programme Specific Outcomes (PSO)	Mean Scores of COs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
1	2	2	2	2	3	3	2	3	2	2	3	2	2.33
2	2	3	2	3	3	2	3	2	3	1	3	2	2.42
3	3	2	1	3	2	2	1	3	2	3	2	2	2.17
4	2	3	2	3	3	2	3	2	3	2	3	2	2.50
5	2	3	2	2	3	2	3	2	3	2	3	2	2.42
Mean Overall Score													2.37
Result													High

Year/Semester: I Yr /II SEM **Code: AM214B**
Credits: 4 **Hours/Week: 6**

Allied Mathematics – II (Chemistry)

Objective: To make the students become familiar with the tools in Mathematics to solve problems in different related fields.

Unit – I: Graphs

What is a graph? - Application of graphs – Finite and Infinite graphs – Incidence and degree – Isolated Vertex, Pendant Vertex and Null graph – Isomorphism – Sub graphs – Walks, Paths and Circuits – Connected graphs, disconnected graphs and components – Euler graphs – Operations on graphs – More on Euler graphs – Hamiltonian paths and circuits – The traveling salesman problem.

(Book 1: Chapter 1(Except 1.6), Chapter 2: 2.1 – 2.10 (Except 2.3))

Unit – II: Probability

Probability – Random experiment – Event – Sample space – Measurement of probability – Classical approach – Relative frequency theory of probability – conditional probability – Baye's theorem.
(Book 2, Chapter 18: pages 737 – 759)

Unit – III: Partial Differential Equations

Elimination of arbitrary constants – Elimination of arbitrary functions – Standard forms – Lagrange's equation.
(Book 3: Chapter 9: Pages: 275 – 302)

Unit – IV: Laplace Transforms

Properties of Laplace transform – Inverse Laplace transform – Partial fractions – Differential equations.
(Book 3: Chapter 10: Pages: 303 – 335).

Unit – V: Fourier Series
Properties of integration – Odd and even functions – Half range Fourier series. (Book 3: Chapter 11: Pages: 341 – 360)

Books for Study

1. Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science –Prentice–Hall of India, 2001.
2. R.S.N. Pillai and Bagavathi, Statistics, S.Chand & co Ltd., New Delhi, seventh revised edition, 2010.
3. G. Britto Antony Xavier, V. Balaji, S.U. Vasantha Kumar, B. Govindan, Mathematical Sciences , Jayalakshmi Publications, Second Edition, 2015.

Books for Reference

1. P. Balasubramaniyam, K. G. Subramanian, Ancillary Mathematics, Volume – I, Tata McGraw – Hill publishing company limited, New Delhi, 1996.
2. P. Duraipandian, S. UdayaBaskaran, Allied Mathematics, Volume – I, Muhil publishers, 1st Edition, Chennai, 1997.
3. P. Kandsamy and K. Thilagavathy, Allied Mathematics Volume – I, Volume – II, S. Chand & Company, New Delhi, 2004.
4. Shanti Narayan, P.K. Mittal, Differential Calculus, S. Chand & Co, New Delhi, 2005.
5. A. Singaravelu, Allied Mathematics, Meenakshi Agency, Chennai, 2001.
6. P.R. Vittal, Allied Mathematics, Margham Publications, Chennai, 1999.

E-Learning source: http://mathforum.org/library/drmath/sets/elem_2d
Course Learning Outcomes:

This course will enable the students to:

CO Number	CO Statement	Knowledge Level
CO1	define Graphs and its types.	K1
CO2	understand the concept of probability and Baye's theorem.	K2
CO3	solve differential equations using standard forms.	K3
CO4	evaluate the ODE using Laplace and inverse	K5

	Laplace transforms.	
CO5	point out the odd and even function and develop the Fourier expansion series.	K4, K6

Mapping of CO with PO and PSO

CO	Programme Outcomes (PO)							Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
1	3	2	1	3	3	2	1	3	3	3	3	2	2.42
2	3	2	1	1	3	2	1	2	2	2	1	3	1.92
3	3	3	2	2	3	3	3	2	3	2	3	2	2.58
4	3	3	2	2	3	1	3	3	2	3	2	1	2.33
5	3	2	1	2	1	2	2	2	2	2	1	3	1.92
Mean Overall Score													2.23
Result													High