

Semester – II

CORE – II

Paper – III (6hrs/week)

DIFFERENTIAL EQUATIONS & ANALYTICAL GEOMETRY OF THREE DIMENSIONS

(90 hours) (AMMA21)

Objectives:

- ❖ To explain ordinary differential equations with Constant and variable Coefficients.
- ❖ To describe sphere, intersection of two spheres and tangency of spheres.

Course Learning Outcomes: It enables the students to

1. know the differential equation with constant & variable Coefficients.
2. understand the shape of a plane sphere in three dimensions.

UNIT – 1:

First order higher degree equations- solvable for x,y,p and Clairaut's form – Simultaneous differential equations of the form $f_1(D)x + g_1(D)y = h_1(t)$, $f_2(D)x + g_2(D)y = h_2(t)$.

UNIT – 2:(Ordinary Differential Equation)

Second order linear differential equations with constant coefficients –
Find the P.I for function of
the form $e^{ax}f(x)$ and $x^n f(x)$ - Linear equations of second order with variable coefficients.

UNIT – 3:

Analytical Geometry of 3D-Co-ordinate system, direction cosines, direction ratios- Equation of plane in different forms - angle between planes-Length of perpendicular-angle of bisection.

UNIT – 4:

Equation of a line in different forms - image of a point- image of a line-The plane and the straight line-angle between plane and line-Coplanar lines-Shortest distance between two lines.

UNIT – 5:

Sphere – Tangent plane – circle of intersections – Tangency of Spheres – Orthogonal Spheres.

Text Books:

1. Narayanan. S and T. K. Manickavasagam Pillai –
Differential equations and its applications, S. Viswanathan Printers Pvt. Ltd, (2006).
2. Manickavasagam Pillai . T. and T. Natarajan – A text book of Analytical Geometry – Part-II Three Dimensions – S. Viswanathan (Printers & Publisher) Pvt. Ltd. (2012).

Books for Reference:

1. Kandasamy. P and K. Thilagavathi- Mathematics for B.Sc., Vol. III & IV – S. Chand and Co., New Delhi. (2004)
2. Braun .M. - Differential Equations and their applications (III edition) Springer – Verlag, New York 1983)
3. Boyce .W.E and R.C. DiPrima – Elementary differential equations and Boundary value Problems (VII editions) – John Wiley and Sons, Inc, New York (2001).

Semester – II

STATISTICS

Allied Paper – II (6hrs/week)

(For Mathematics Students)(90 hours) (AMMA31)

Objectives:

- ❖ To know the importance of Correlation and regression.
- ❖ To explain the basic concepts of various types of distribution.

Course Learning Outcomes: It enables the students to

1. understand the probability distribution Binomial, Poisson and normal.
2. study the Statistical Quality Control and Product Control.

UNIT – 1:

Characteristics of index numbers – Laspeyer's and Paache's – Fisher's and Browley and Edge worth's index numbers Test – Unit Test, Commodity Reversal Test, Time Reversal Test, Circular Test.

UNIT – 2:

Testing of Hypothesis– Null hypothesis and Alternate hypothesis –Type I and Type II errors - Critical Region, Level of significance–Test of significance for large samples– Testing a single proportion– Difference of proportions. Testing a single mean and Difference of means..

UNIT – 3:

Tests based on t-distribution- Single mean and Difference of means – Tests based on F-Distribution – Variance Ratio Test based on Chi-Square Distribution – Independence – Goodness of fit.

UNIT – 4:

Analysis of Variance – one way and two way classified data – Basic of experimental design – Randomized Block Design – Latin Square – Simple Problems.

UNIT – 5:

Statistical Quality control – Definition – Advantages, Process Control – Control Chart, Mean Chart, Range Chart, P-Chart, Product Control – Sampling Inspection Plans.

Text Books:

1. Statistics -ArumuganThangapandi for (Unit- I,II& III).
2. Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics –(2002)Sultan Chand&Sons, New Delhi, for (Unit- IV & V).

Books for Reference:

1. Vittal.P.R–MathematicalStatistic(2004)–Maragatham Publications.
- 2.DC Sancheti&Kapoor –Statistics.
- 3.M.L.Khanna–Statistics.