ALLIED COURSE: I B.Sc., INFORMATION TECHNOLOGY

ESSENTIALS OF MATHEMATICS

OBJECTIVES:

- *To understand the basic skills of Mathematics*
- *To Provide the knowledge of Mathematics in formal deductive reasoning*
- *To solve Algebraic problems using the knowledge of equations.*
- *To introduce the basic concept of Differentiation.*
- *To provide working knowledge about combinatorial analysis.*

UNIT-I: SETS AND ELEMENTS

Sets and Elements, Universal set, Empty set, Subset, Venn Diagrams, Union and Intersection, Complement, Classes of Sets, Power sets, Partition, Ordered Pairs, Product sets, Relations, equivalence Relations and Functions.

UNIT-II: THEORY OF EQUATIONS

Elements of Algebra – Functions – Linerar equations – simultaneous Linear equations – quadratic functions and equations – Realation between roots and coefficients – solving the equations whose roots are in A.P, G.P and H.P.

UNIT-III: DIFFERENTIAL EQUATIONS

Variable separable – Linear equations – second order of types $(aD^2+bD+c)y = f(x)$ where a, b, c are constants and f(x) is one of the following types (i) e^{kx} (ii) sin(kx) , cos(kx). x^n n being an integer.

UNIT- IV:VECTORS AND MATRICES

Introduction – Vectors – Matrices – Matrix addition and Scalar Multiplication – Matrix Multiplication – Square Matrix – Invertible Matrix – Determinants – Subscribted Variables – Linear equations in one and two unknowns – Gauss elimination method.

UNIT- V:COMBINATORIAL ANALYSIS

Introduction – Factorial notation – Binomial coefficients – Permutations – Permutation with repetition ; Partitions – combinations – Tree diagrams.

TEXT BOOKS:

[1] "Essential Computer Mathematics'' Seymour lipschtzschamu's outline 2004.

[2] " Algebra vol I'' T.K.ManickavasagamPillai – s.Viswanathan Printers 2008.

UnitI : Chapter 6 Sec 6.1 to 6.15 [1]

UnitII : Chapter 1 Sec 1, 2, 4, 5 and 6 [2]

Unit III: Chapter 9 sec 1 to 4 [2]

Unit IV: Chapter 9 full and Chapter 10 (10.1 to 10. 6) [1]

Unit V: Chapter 11 Section 11.1 to 11.7[1]

REFERENCE BOOKS:

(1) 'Mathematical Foundation' P.R.Vittal – Margham Publications.

(2) 'Allied Mathematics', S.G.Venkatachalapathy, Margham Publications 2007.

ALLIED COURSE : 1 **SEM : I**

B.Sc / B.C.A. COMPUTER SCIENCE AND COMPUTER APPLICATIONS

ALGEBRA AND CALCULUS

OBJECTIVES:

- *To understand the basic skills of Mathematics*
- *To mode the fundamental principles in the area of calculus.*
- *To solve Algebraic problems using the knowledge of equations.*
- *To introduce the basic concept of Differentiation and Integration.*
- *To access students in making the transition from the arithmetic to the symbolic.*

UNIT-I : THEORY OF EQUATIONS

Introduction- In equation with rational coefficients irrational roots occur in pairs- Relations between roots and coefficients of equations- transformation of equations- Diminishing, increasing and multiplying the roots by a constant- forming equations with given roots.

UNIT-II: MATRICES

Introduction to Matrices – Singular Matrices – Inverse of Non-Singular matrix using adjoint method – Rank of Matrix – Consistency – Characteristic equation, Eigen Values, Eigen Vectors – Cayley Hamilton's Theorem (Proof not needed) – Simple applications only.

UNIT-III : DIFFERENTIATION AND SUCCESSIVE DIFFERENTIATION

Definition – Differential Co-efficients product rule – Quotient rule – Function of function rule – Inverse Functions – Hyperbolic functions – Transformation – Successive Differentiation: n^{th} derivative – TrigonometricalTransformations –Leibnitz formula for n^{th} derivative – formulas and simple applications only.

UNIT- IV: DIFFERENTIAL EQUATIONS

Differential equations of first order - Variable separable – Linear equations – Second order of types (aD2+bD+c)y=f(x), where a, b, c are constants and f(x) is one of the following types: (i)e^{kx} (ii)Sinkx (or) Coskx, where k be a constant (iii) x^n, n being integer.(Simple Problems only)

UNIT- V: INTEGRATION

Integration – Definite integral – Integrals of function containing linear functions of x Integration of Rational Algebraic Functions and Rule (a), (b) and (C).(Simple Problems only)

TEXT BOOKS:

[1] 'Algebra vol. I and Vol. II', T.K.ManicavachagamPillai and Others, S.V. Publications 2011.
[2] 'Calculus, Vol. I and Vol. II', T.K.ManicavachagamPillai and Others, S.V. Publications 2011.

UnitI : Chapter 6 (Sec 10, 11, 15, 17, 18) [1], Vol I
UnitII : Chapter 2 (Sec 1 – 8 and 10 – 16) [1],Vol II
UnitIII :Chapter 2 (Sec 2.1 – 3.6, 3.8 – 3.14 and 4.3) and Chapter 3 [2], Vol. I
Unit IV : Chapter 1 (Sec 1.1 – 1.3 formulas only),7.3 Chapter 9 (Sec 1, 3 and 4) [2], Vol. I
Unit V: Chapter 1 (Sec 1.1- 7.4) [2], Vol. II

References

(1) 'Differential Calculus'. M.L.Kanna, Jai Prakashnath& Co.,
(2) 'Allied Mathematics', S.G.Venkatachalapathy, Margham Publications 2007.

ALLIED COURSE:2 CLASS: B.Sc., CS/CA/IT SEM:II

CODE:U2NITORAC2/ U2NMORAC2

OPERATIONS RESEARCH

OBJECTIVES:

- *To Introduce Operations Research, Linear programming formation and role of Computer in OR.*
- *To develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions to these problems.*
- *To introduce concepts of slack and surplus variables.*
- *To improve the skills of solving very common problems which we come across in various fields like transportation, Sequencing Problems and industries with machines.*
- *To introduceNetwork and to find critical path.*

Unit I: Introduction to OR

Introduction - basics of OR - OR & decision making - Role of computers in OR - Linear programming formulations & graphical solution of two variables - canonical & standard forms of LPP.

Unit II : Solving L.P.P

Introduction - concepts of slack & surplus variables - simplex method - algorithm for simplex method for <, =, >, constraints - Charne's method - algorithm for a Charne's method, Charne's method of penalties (Big. M method) problems.

Unit III: Transportation & Assignment Problem

Transportation algorithm - concepts of feasibility basicness, methods used to find the solution to a TP - Unbalanced transportation problem - assignment algorithm - General model of the assignment problem - unbalanced assignment problem - solution to the assignment problem.

Unit IV: Sequencing Problems

Problems of sequencing - Processing of n jobs through two machines - processing of n jobs through 3 machines.

Unit V: Networks

Introduction to Network - Fulkerson's rule - measures of activity - CPM - Finding the critical path – calculating TF, FF, IF, PERT computation.

TEXT BOOK

[1] Manmohan& Gupta, "**Operations Research"**, Sultan Chand Publishers, New Delhi, 1999.

[2] "**Research Management Techniques (OR)"**Sundaresan,Ganapthy, Balasubramanian and Ganesan,A.R.Publications,Arpakkam-609111. SirkaliTaluk, Phone:04364-270081 Cell:9443351098.

Unit I : Chapter 1 - 3 [1]

Unit II : Chapter 4 - 6 [1]

Unit III : Chapter 15 - 16 [1]

Unit IV : Chapter 10 - Sec. 10.1 to 10.4 [1]

Unit V : Chapter 15 - Sec. 15.1 to 15.7 [2]

REFERENCE BOOK

1) Prem Kumar Gupta and D.S.Hira, "An **Introduction of Operations Research**", S.Chand and co., Ltd. New Delhi, 1995.

2) HumdyA.Taha, "**Operations Research** " (7^{th}Edn.), Mcmillan Publishing Company, New Delhi, 1982.

ALLIED COURSE: 3CLASS: B.Sc., CS/CA/IT SEM:II

CODE:U2NMNMCAC3

NUMERICAL METHODS AND STATISTICS

OBJECTIVES

- *To understand the concept of transcendental and polynomial equations.*
- *To Know how to use numerical methods to solve Simultaneous Linear Equations*
- *To know the techniques of Numerical Differentiation and Numerical Integration.*
- *To understand how to find solution of difference equations, Algebraic and Transcendental equations and Numerical solution of Ordinary differential equations of first order.*
- *To understand Mean, Median, Mode, Standard Deviation, Correlation and Regression.*

Unit 1: Solution Of Algebraic And Transcendental Equation:

Bisection Method, Method Of False Position, Iteration Method, Newton Raphson Method - Problems Only.

Unit II: Solution Of Simultaneous Linear Equations:

Gauss Elimination Method, Gauss Jacobi Method, Gauss Jordan Method, Gauss Seidel Method- (no proof needed).

Unit III: Numerical Interpolation:

Newton's Forward And Backward Interpolation Formulae, Lagrange's Interpolation Formula, Divided Differences – Newton's Formula Only–(formula derivation not needed).

UnitIV: Numerical Differentiation, Integration And NumericalSolution To ODE

Newton's Forward And Backward Differentiation Formula – Trapezoidal And Simpson's1/3rd And 3/8th Rule – Euler's Method, modified Euler's Method And Runge – Kutta 2nd Order Only - Simple Numerical Problems Only.

Unit V: Statistics:

Mean, Median, Mode, Standard Deviation, Correlation And Regression – Simple Numerical Problems Only.

Text books:

[1] S.S.Sastry :"**Introductory methods of numerical analysis**". Prentical Hall India 1994.

[2] S.P.Gupta :"**Statistical methods".** S.Chand& Company, New Delhi.

[3] N. Subramaniam: "**Numerical Methods**",Scm Publishers, Erode.

Unit I :Chapter 2.1, 2.2, 2.3, 2.4, 2.5 [1]

Unit II :Chapter I, Sec 1.2 fully [3]

Unit III:Chapter II sec2.1,2.2, 2.3 only [3]

Unit IV :Chapter II 5.2, 5.4.1,5.4.2,5.4.3,7.4, 7.4.2 ,7.5 [1]

Unit V :Chapter II, Sec 2.5,2.6,2.7 [2]

REFERENCE BOOK

1.P.Kandasamy "Numerical Methods" S.Chand& Co., New Delhi, .1998

2.R.S.N. Pillai and Bagavathi S, "**Statistics**" Chand & Co Ltd., New Delhi, 1999.

ALLIED COURSE:1 **SEM: I** **CODE: U1NMTAC1**

B.Sc., PHYSICS/ CHEMISTRY/ INDUSTRIAL ELECTRONICS

CALCULUS AND FOURIER SERIES

Objectives:

- To find the derivative of the function using the limit definition
- To apply the basic rules of differentiation and to find the derivative of algebraic and trigonometric functions.
- To find higher order derivatives and to use implicit differentiation.
- To solve heat equation in metal plane.
- To represent a periodic signal with continuous time Fourier series

UNIT I: SUCCESSIVE DIFFERENTIATION

Successive Differentiation - n^{th} derivative of standard functions (Derivation not needed) simple problems only-Leibnitz Theorem (proof not needed) and its applications – Curvature – circle and radius of curvature in Cartesian only (proof not needed) .

UNIT II: EVALUATION OF INTEGRALS

Evaluation of integrals of types

$$\int \frac{px+q}{ax^2+bx+c}dx \qquad \int \frac{px+q}{\sqrt{ax^2+bx+c}}dx \quad \int \frac{dx}{a+bcosx} \int \frac{dx}{a+bsinx}$$

Integration by trigonometric substitution and by parts of the integrals (Problems only)

$$\int \sqrt{a^2-x^2}\,dx \int \sqrt{a^2+x^2}\,dx \int \sqrt{x^2-a^2}\,dx$$

UNIT III : DEFINITE INTEGRAL

General properties of definite integrals - Evaluation of definite integrals of types

$$\int_a^b \frac{dx}{\sqrt{(x-a)(b-x)}}, \int_a^b \sqrt{(x-a)(b-x)}dx, \int_a^b \sqrt{\frac{x-a}{b-x}}\,dx$$

Reduction formula (when n is a positive integer) for

$$\int_a^b e^{ax}x^n dx, \quad \int_a^b sin^n x\,dx, \int_a^b cos^n x\,dx, \int_0^x e^{ax}x^n\,dx, \int_0^{\frac{\pi}{2}} sin^n\,xdx \qquad \int_0^{\frac{\pi}{2}} sin^n\,xcos^m\,xdx$$

(Problems only)

UNIT IV: MULTIPLE INTEGRALS

Evaluation of Double and Triple integrals in simple cases - Changing the order and evaluating of the double integration. (Cartesian only)

UNIT V - FOURIER SERIES

Definition of Fourier Series - Finding Fourier Coefficients for a given periodic function with period 2π - Use of Odd & even functions in evaluating Fourier Coefficients - Half range sine & cosine series.

TEXT BOOKS:

[1] " CalculusVol I", S. Narayanan, T.K. ManchavasagamPillai, S.V. Pvt. Ltd, 2003.

[2] " CalculusVol II", S. Narayanan, T.K. ManchavasagamPillai, S.V. Pvt. Ltd, 2003.

[3] "Allied Mathematics" - S.G.Vengatachalapathy, Marghum Publications

Unit I : Chapter 3 - Fully, Chapter 10 - 2.1, 2.3 [1]

Unit II : Chapter 1 - Sec. 7.3 (b), Sec. 8case(ii),case(iii) , Sec. 9, fully [2]

Unit III : Chapter 1 - Sec. 11 - fully, sec. 13, 13.1, 13.3, 13.4, 13.5, Sec 8-case(ix) [2]

Unit IV : Chapter 5 - Sec. 2.1, 2.2 & Sec. 4 [2]

Unit V : Chapter 12 - Page12.1 to 12.40 [3]

REFERENCE BOOK:

1) "Engineering Mathematics" - Babu Ram - Pearson Publication

ALLIED COURSE: 2 **SEM: I (N.S) & II (S)**

B.Sc., PHYSICS / CHEMISTRY / INDUSTRIAL ELECTRONICS

ALGEBRA, ANALYTICAL GEOMETRY (3D) AND TRIGONOMETRY

Objectives

- To carry out the basic operation of matrix algebra
- To analyze and solve world problems in practical situations
- To synthesize all the mathematical presentation of problems
- To practice manipulating trigonometric functions and in substituting equivalent expression
- To analyze situations, check for limitations, examine appropriate methods of solution using trigonometry

UNIT I - BINOMIAL, EXPONENTIAL AND LOGARITHMIC SERIES

Important expansions - summation & approximation related problems only - limits and approximations.

UNIT II – MATRIX

Non-singular, Symmetric, Skew Symmetric, Orthogonal, Hermitian, Skew Hermitian and Unitary matrices - Characteristics equation, eigen values, eigen vectors - Cayley Hamilton's theorem (proof not needed) - Simple applications only.

UNIT III - ANALYTICAL GEOMETRY (3D)

Finding the shortest distance between two skew lines and the equation of the plane containing them - Condition of Coplanarity - Equation of a Sphere - Tangent plane - Plane section of a sphere - Finding the center & radius of the circle of intersection - Sphere through the circle of intersection (only problems in all the above)

UNIT IV - EXPANSION

Expansion of Sin nθ, cos nθ, tan nθ (n being a positive integer) - Expansion of $Sin^n\theta$, $Cos^n\theta$, $Sin^n\theta Cos^m\theta$ in a series of sines& cosines of multiples of θ (θ - given in radians) - Expansion of sinθ, cosθ and tan θ in terms of powers of θ (only problems in all the above).

UNIT V - HYPERBOLIC FUNCTIONS

Euler's formula for $e^{i\theta}$ - Definition of Hyperbolic functions - formulae involving Hyperbolic functions - Relation between Hyperbolic & circular functions - Expansion of sinh x, cosh x, tanh x in power of x-Expansion of Inverse hyperbolic function $\sinh^{-1}x$, $\cosh^{-1}x$ and $\tanh^{-1}x$.

Text Books:

[1] T.K.ManicavachagamPillai, T.Natarajan, K.S.Gnanapathy, "Algebra, Vol. I, algebra, Vol. II), S.Viswanathan Pvt. Limited, Chennai, 2004.

[2] S.NarayananT.K.ManichavasagamPillai, "Trignometry" S.ViswanathanPVt. Limited, and Vijay Nicole Imprints Ptvt Ltd, 2004.

[3] T.K.ManickavasagamPillai, Analytical Geometry (3D) and Vector Calculus, New Gamma Publishing House, 1991.

Unit I : Chapter III, IV - Simple problems only in [1] Vol. [1]

Unit II : Chapter II - fully in [1] vol. [2]

Unit III : Chapter I - Sec. 1, 2, Chapter IV, Sec. 35 to 41 [3]

Unit IV : Chapter III, 2.1 to 2.3[2]

Unit V : Chapter IV, fully [2]

Reference Book:

1) "Analytical Geometry", Duraipandian & Chatejee

2) "Trigonometry"- Arumugam& others - New Gamma publications.

ALLIED COURSE:3 **SEM: II**

CODE:U2NMTAC3

B.Sc., PHYSICS/ CHEMISTRY/ INDUSTRIAL ELECTRONICS

ODE, PDE, LAPLACE TRANSFORMS AND VECTOR CALCULUS

Objectives:

- To formulate ODE and seek understanding of the solution.
- To solve PDE with difference method.
- To understand the idea to transform the problem into another problem that is easier to solve.
- To use various theorems to give a physical interpretation of a vector field.
- To introduce physical problems in Engineering and Biological models.

UNIT I - LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS

Definition – The operator D – Complementary function of a Linear equations with constant coefficients - Finding Particular integrals in the cases of e^{kx}, sin (kx), cos (kx) (where k is a constant), x^k where k is a positive integer(only problems) in all the above - No proof needed for any formula.

UNIT II - FORMATION OF PARTIAL DIFFERENTIAL EQUATIONS BY ELIMINATING CONSTANTS AND BY ELIMINATION OF ARBITRARY FUNCTIONS

Definition of general, particular & complete solutions - Singular integral (geometrical meaning not required) - Solutions of first order equations in the standard forms - 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 = xp+yp+f(p,q) - Lagrange's method of solving Pp+Qq=R, where P, Q, R are functions of x, y, z - (Geometrical Meaning is not needed) - (**only simple problems** in all the above - No proof needed for any formula).

UNIT III - LAPLACE TRANSFORM

Definition - L(e^{at}), L(Cos(at)), L (sin (at)) L(t^n), where n is a positive integer. Basic theorems in Laplace Transforms (formula only)-L [e^{-st}cosbt], l [e^{-st}sin bt], L[e^{-st}f(t)] - L [f (t)], L [f' (t)], L [f'' (t)] - Inverse Laplace Transforms related to the above standard forms - solving second order ODE with constant coefficients using Laplace Transforms.

UNIT IV - VECTOR DIFFERENTIATION

Vector function – limit and continuity of a Vector function– Derivative of a Vector function with respect to a scalar – Integration of Vectorfunctions – Partial derivatives of vectors – the Vector Differential operator Del - Gradient of a Scalar field– Definition - Directional derivative of a scalar point function -tangent plane and normal to a level surface – Divergence of a Vector function - Curl of a Vector function.

UNIT V - VECTOR INTEGRATION

Line integrals - surface integrals - volume integrals –Green's theorem - Gauss Divergence Theorem - Stoke's Theorem (statement, application & verification only, No proof needed)

Text Books

[1] "Differential Equations",S.NarayananS.Viswanathan Publishers, 1996.

[2] "Vector Calculus" by J. N. Sharma and A.R. Vasishtha published by Krishna PrakashanMandir(1984) Co., 9^{th} Edition.

Unit I : Chapter 1 – 5

Unit II : Chapter 12 sec 1, 2, 3.1, 3.2, 4, 5.1, 5.2 [1]

Unit III : Chapter 9, Sec. 1 - 8 [2]

Unit IV : Chapter 1,2, pg. no : 1 – 9, 12- 31, 37- 70 [2]

Unit V : Chapter 3, pg. no : 76- 151 [2]

References:

1. "Ordinary and partial differential equation", M.D.Raisinghania - S. Chand & Co
2. "Mathematical physics" -B.D.Gupta - Vikas Publications.

CORE COURSE: III B.SC. BIOTECHNOLOGY SEM : VI

BIOSTATISTICS

Objectives :

- **Describe basic concepts of probability, random variation and commonly used statistical probability distributions.**
- **Apply common statistical methods for inference.**
- **Calculate descriptive statistics related to public health.**

UNIT I – INTRODUCTION TO BIOSTATISTICS

Definition of Statistics and Biostatistics - Development- Application-Role-Data and its collection-Classification of Data - Characteristic of Statistics - Importance and Usefulness of Statistics - Limitation of statistics.

UNIT II –TABULATION AND GRAPHICAL REPRESENTATION

*Tabulation and Frequency Distribution:*Tabulation-Frequency Table of Frequency Distribution-Preparation of a frequency Table..

*Graphical representation :*Types of Graphs, Line Graph , Bar Diagram, Histogram, Frequency Polygon, Frequency Curve.

UNIT III - MEASURES OF CENTRAL TENDENCY AND DISPERSION

Measures of central tendency : Characteristics of an Ideal Measures of Central tendency- Arithmetic mean - median and mode (definition, merits and demerits, problems based on raw, discrete and continuous data).

Measures of dispersion : Variability- range - mean deviation - standard deviation - variance and coefficient of variation (definition, merits & demerits, problems based on raw data only).

TEXT BOOKS

[1] " Biostatistics" – P.N.Arora and P.K. Malhan, Himalaya Publication House,2006

Unit I : Chapter 1: 1.1-1.5,1.8,1.9,1.11-1.13[1].

Unit II : Chapter 3: 3.1 - 3.3 & Chapter 4: 4.2, 4.4, 4.5, 4.6, 4.9, 4.10, 4.12[1].

Unit III : Chapter 5: 5.2, 5.3,5.7,5.8- 5.19 and

Chapter 6: 6.1,6.2,6.4,6.6,6.7-6.10,6.13[1].

REFERENCE BOOKS

1. Introduction to Biostatistics – Sokaland Rohlf – Toppan Co. Japan

2. Primer of Biostatistics – Stanton A.Clantz – The McGraw Hill Inc. Newyork

ALLIED COURSE:4 CLASS :B.Sc., Microbiology / Biochemistry SEM:III CODE:

BIOSTATISTICS

Objectives:

- Update and expand the basic knowledge of mathematics.
- To review the basic concepts and knowledge in collection of Data
- Develop the skills pertinent to practice Measures of central tendency.
- The students will collect and analyze data using biological materials.

UNIT I - INTRODUCTION TO BIOSTATISTICS

Biostatistics : Definition- Developments – Applications- Role- Definition of Statistics – Characteristics – Limitations.

UNIT II - COLLECTION AND PRESENTATION OF DATA

Collection of data : Data collection-Primary data – secondary data, Classification *Sampling:* Sampling method- types of sampling.

Classification and Tabulation: - Types of classification - Tabulation of data - Parts of a table - types of tabulation.

Diagrammatic representation : Rules, limitations - Bar diagram (Simple, multiple, component / staked, proportional / percentage) - pie diagram.

Graphical representation : rules, limitations - difference between diagram and graphs - histogram - frequency polygon - frequency curve - Ogive curve

UNIT III - MEASURES OF CENTRAL TENDENCY

Measures of central tendency : Introduction - characteristics - Arithmetic mean - Median - Mode - Geometric mean, Harmonic Mean (definition, merits and demerits, problems based on raw, discrete and continuous data)

UNIT IV - MEASURES OF DISPERSION

Measures of dispersion : Definition - Characteristics - Range - Mean derivation - Standard deviation - Coefficient of variation (definition, merits & demerits, problems based on raw data only)

UNIT V – SKEWNESS AND KURTOSIS

Skewness : Definition, Types, Karl Pearson coefficient of Skewness, Bowley's coefficient of Skewness - Related problems, Kurtosis & moments (concept only).

Text Books:

[1] "Biostatistics" - P.N. Arora, P.K.Malhan, Himalaya Publishing House.(2014).

[2] "Fundamentals of Biostatistics" - Veer BalaRastogi, Ane Books Pvt. Ltd. (2008).

Unit I : Chapter 1, Sec. 1.1 -1.5, 1.11 – 1.13[1] Chapter1, page no. 8-11 [2]

Unit II: Chapter 1, Sec. 1.8, 1.9 [1] Chapter 3, Sec. 3.1-3.3 [1]

Chapter 4, Sec. 4.1 - 4.12 [1] Chapter 3, Pg. no. 25-30 [2]

Unit III : Chapter 5, Sec. 5.1,5.3, 5.7 – 5.19, 5.21 – 5.24 [1]

Unit IV : Chapter 7, Page No. 133 – 138, 146-155 [2]

Unit V : Chapter 7, Sec. 7.1, 7.2, 7.5 - 7.9 [1]

Reference Books

1. "Introduction to Biostatistics" – Sokaland Rohlf – Toppan Co. Japan

2. "Primer of Biostatistics" – Stanton A. Clantz – The McGraw Hill Inc. Newyork.

ALLIED COURSE:AC5B.Sc. Microbiology SEM: IV CODE:U4NMBAC5P

BIOSTATISTICS PRACTICAL

Objectives:

- To Update and expand the basic knowledge of mathematics.

- To review the basic concepts and knowledge in Measures of central tendency.
- Develop the skills pertinent to practice of Mathematics.
- The students will collect and analyze data using biological materials.
- To study about the Test of significance using t- test and chi-square test. This will be very useful to the students for research purpose.

Unit I: Distributions

Construction of discrete frequency distributions - continuous frequency distribution (univariate and bivariate)

Unit II: Graphical Representation

Graphical representation of statistical data - Simple bar diagram, Multiple bar diagram, Component bar diagram, Percentage bar diagram, Rectangle bar diagram and Pie diagram

Unit III: Diagrammatic Representation

Diagrammatic representation of statistical data - Histogram, Frequency polygon, Frequency curve, Ogive curve.

Unit IV: Measures of central tendency

Calculation of arithmetic Mean, Median, Mode, Geometric mean, Harmonic mean and Coefficient of variance using biological materials.

Unit V: Test of Significance

Test of significance t-test-single mean and two means, Chi-square test of independence of attributes and goodness of fit.

Text Books:

[1] "BIO STATISTICS" - P.N.Arora, P.K.Malhan, Himalaya Publishing House, 2006

[2] "BIO STATISTICS", P.Rama Krishnan, Saras publications, 1995

Unit I : Chapter 3- Sec. 3.3 [1] Chapter 3- P.No.57 - 60 [2]

Unit II : Chapter 4- Sec. 4.5, 4.6 [1]

Chapter 4 - P.No. 74 to 78 [2]

Unit III : Chapter 4- Sec. 4.9, 4.10, 4.11, 4.12, 4.13 [1]

Chapter 5 - P.No. 91 - 100 [2]

Unit IV : Chapter 5- Sec. 5.2, 5.3, 5.8, 5.13, 5.21, 5.23 [1]

Chapter 6 - Sec. 6.6 [1]

Unit V : Chapter 13 - Sec. 13.9, 13.10 [1] and Chapter 14 - Sec. 14.7, 14.8 [1]

Chapter 12 - P.No. 325 - 330 [2] andChapter 13 - P.No. 335 - 342 [2]

Reference Books:

1. Introduction to Biostatistics – Sokaland Rohlf – Toppan Co. Japan

2. Primer of Biostatistics – Stanton A. Clantz – The McGraw Hill Inc. Newyork.

ALLIED COURSE: 3I B.B.A.SEM:II CODE:U2NBAAC3

BUSINESS MATHEMATICS AND STATISTICS

Objectives:

- To understand the application of derivative in business
- To use determinants and matrices to model and solve problems
- Statisticians help to design data collection plans, analyze data appropriately and interpret and draw conclusions from those analyses.
- The following may be applied to one dimensional data. Depending on the circumstances it may be appropriate to transform the data before calculating central tendency.
- Calculate correlation for subgroups using split file. Correlation used to test the degree of association between variables.

UNIT I: DIFFERENTIATION

Addition rule, difference rules and product rule. Maxima and minima – application of derivatives in business step for finding an optimum value of function.

UNIT II- MATRIX AND DETERMINANTS

Basic concepts – addition , subtraction and multiplication of matrices – elementary operations – Transpose of Matrix, inverse ,Solving equations by Matrix Method Determinants and solution of simultaneous liner equations – Cremer's rule.

UNIT III - STATISTICS

Definition – Nature – scope and Objectives – diagram – Matrix representation – One, Two and three dimensional diagram – Graphic Representation – Histogram, frequency polygon frequency Curve, Histogram and pie diagram – classification and tabulation.

UNIT IV – MEASURES OF CENTRAL TENDENCY & MEASURES OF DISPERSION

Mean Median, Mode, Geometric mean, harmonic mean, Rang, Quartile Deviation, Mean deviation, Standard deviation and Co-efficient of variation.(definition, merits and demerits related simple problems)

UNIT V – SIMPLE CORRELATION & SIMPLE REGRESSION ANALYSIS

Karl Pearson's coefficient of correlation and spearman's rank correlation – properties of correlation, properties or Regression – Regression lines and estimation

TEXT BOOK

[1] "Business Mathematics and statistics " PA. Navnitham. JAI Publishers , new No.19, seventh cross, Sundar Nagar, Trichy – 620021

[2] Fundamental of Mathematical Statistics – Gupta Kapoor –Chand & Sons.

Unit I : Chapter 6 and 7 [1]

Unit II: Chapter 4 [1]

Unit III: Chapter 1,2,3,4,5 and 6 [1]

Unit IV: Chapter 2 & 3, Sec 2.6-2.9, 3.3 – 3.7, 3.8.1 [2]

Unit V: Chapter 12 and 13 [1]

REFERENCE BOOKS

1) Business Mathematics – Sancheti and Kapoor
2) Statistics – R.S.N. Pillai and Bagavathi.

ALLIED COURSE: 6II B.B.A.SEM:IV CODE:U4NBAAC6

OPERATIONS RESEARCH

Objectives:

- To provide the students mathematical teaching to model and analyze decision problems with effective application to real life in optimization of objectives.
- The Central objective of OR is Optimization. i.e"to do things best under the given circumstances".
- The basic concept behind sequencing is to use the available facilities in such a manner that the cost(time) in Minimized.
- The Assignment problem is one of the special type of transportation problem for which more efficient solutions.
- The Replacement is concerned with the equipment and Machinery that deteriorates with time.

UNIT I-OPERATION RESEARCH

Nature of OR-Modelling in OR- Scope-Limitations-Decision making-Linear Programming Problem- Formulation of LPP- Solution to an L.P.P-Graphical Method.

UNIT II-TRANSPORTATION PROBLEM

Introduction -Formulation of a Transportation Problem-Solving T.P. by North-West-Corner rule, Least Cost method and Vogel's approximation method and finding the initial basic feasible solution using these methods-Modi Method.

UNIT III- SEQUENCING

Introduction – Assumptions – Methods of Sequencing – Johnson's Method – Graphical Method.

UNIT IV-ASSIGNMENT PROBLEM

Introduction-General Model of the assignment-Conversion into an equivalent L.P.P. Solving Assignment Problem-Travelling salesman model –Hungarian method.

UNIT V-REPLACEMENT DECISIONS

Introduction-Concepts of Replacement-Replacement of Equipment that deteriorates gradually-Replacement of equipment that fails suddenly.

TEXT BOOK

[1]"Operation Research" byKantiswarup, P.K.Gupta and Manmohan.

[2]"Operation Research Methods and Applications"-P.Mariappan-New Century book House Ltd.

Unit I: Chapter 1,1.3,1.5,1.6,1.9,1.10.

Chapter 2,2.1-2.4. and Chapter 3, 3.1-3.3 [1]

Unit II: Chapter 10, 10.1, 10.2, 10.8, 10.9, 10.13 [1]

Unit III:Chapter 9, 9.1 – 9.3 [2]

Unit IV: Chapter 5, 5.1 – 5.5 [2]

Unit V: Chapter 10,10.1-10.4[2]

REFERENCE BOOK

1) "Operations Research" A.TAHA

2) "Operations Research and Quantitative Analysis" by Premkumar Gupta and H.S.Hiva.

CORE COURSE:3 I B.COM SEMESTER : II SUBJECT CODE:U2NCMCC3

BUSINESS STATISTICS

OBJECTIVES :

- *To understand how an average gives simple and brief description on the main features of the whole data.*
- *Able to compare two or more series with help of the measures of dispersion.*
- *Introduce linear correlation, independent and dependent variables and the types of correlation.*
- *Time series data are collected on the same observation unit at multiple time periods.*
- *To appreciate the use of index numbers in a range of practical situation.*

UNIT I DATA PRESENTATION &MEASURES OF AVERAGES

Introduction - tabulation and classification - diagrams and graphs:Bar diagram, Pie diagram Histogram Frequency PolygonOgives- measure of Central Tendency - arithmetic mean, median, mode, geometric mean and harmonic mean(Omitted weighted average method).(Direct method only).

UNIT II MEASURE OF DISPERSION

Measure of dispersion -range - quartile deviation - mean deviation - standard deviation - co-efficient of variation (Direct method only)

UNIT III SKEWNESS AND CORRELATION

Measurement of Skewness- Karl Pearson'smethod &Bowley's Methods - Correlation - Karl Pearson's correlation co-efficient –Spearman's rank correlation co-efficient.

UNIT IV REGRESSION AND TIME SERIES

Regression analysis - Simple regression - equations - X on Y - Y on X - Time series analysis - components - Fitting a straight line by method of least square.

UNIT V INDEX NUMBERS

Index numbers - Weighted and unweighted - Price index numbers - Types - Tests in index numbers - Time and factor reversal test - cost of living index number - aggregate method - family budget method

(PROBLEM 75% THEORY 25%)

TEXT BOOK:

[1] "**Business Mathematics And Statistics"** by PA.Navnitham, M.Sc., M.Phil. Jai Publication, Trichy – 2 , July 2011.

Unit I: Chapter 5 pg no 60 -91, Chapter 6 pg no 98 - 145, Chapter 7 pg no 159 – 269.

Unit II : Chapter 8 pg no 301 - 368

Unit III: Chapter 9 pg no 396 -416 , Chapter 12 pg no 503 – 522

Unit IV : Chapter 13 pg no 540 -563 , Chapter 14 pg no 579 -58s3, 594 -601.

Unit V : Chapter 10 pg no 444 -463, 467 - 471

REFERENCES:

[1] "**Business Statistics**" - PR Vittal- Marghanpublications, Reprint 2004

[2] "**Statistical methods**" by S.P.Gupta - Chand & Sons - 1995