PONDICHERRY UNIVERSITY
(A CENTRAL UNIVERSITY)

B.Sc. STATISTICS
(CBCS)

REGULATIONS & SYLLABUS

2017-2018 ONWARDS
PREAMBLE

PONDICHERRY UNIVERSITY
B.Sc. DEGREE COURSE

REGULATIONS
(UG PROGRAMME IN B.Sc. (STATISTICS) DEGREE COURSE)

The revised syllabus shall be effective from the academic year 2017-2018 onwards.

DURATION OF THE COURSE

Prescribed Undergraduate studies in B.Sc., Statistics shall be of six consecutive semesters (three years). The maximum duration allowed for each student to acquire prescribed number of credits in order to complete the Programme of Study shall be twelve consecutive semesters (six years).

AGE LIMIT

The rules as applicable to other Under Graduate courses as prevailing in Pondicherry University.

ELIGIBILITY FOR ADMISSION

Students who have passed their Higher Secondary Examination under 10+2 system conducted by the Government of Tamil Nadu or any other equivalent system recognized by the Government of Puducherry based on the admission criteria laid down by Pondicherry University are eligible to apply to appropriate UG Programme of Study.

MEDIUM OF INSTRUCTION

The medium of instruction for all the courses, excepting Arabic, Bengali, French, Hindi, Malayalam, Sanskrit, Tamil, and Telugu, shall be English.

PATTERN OF EXAMINATION

- The End-Semester examination for each course in a Programme of Study shall be conducted by the Pondicherry University for a maximum of 75 marks and Internal Continuous Assessment for 25 marks.

- Internal assessment for all theory courses shall be done on the basis of at least two Internal Assessment tests (15 marks), term papers/assignments/seminars/case demonstrations/presentations/write-ups/viva etc. (5 marks) and attendance (5 marks). The following weightage shall be given to attendance:
  - 95% - 100% (5 marks)
  - 90% - 94% (4 marks)
  - 85% - 89% (3 marks)
  - 80% - 84% (2 marks)
  - 75% - 79% (1 mark)
• No student with less than 75% in any particular course shall be permitted to attend the end-semester examination and shall be given grade FA-failure due to lack of attendance. However, an overall condonation of 10% is permitted for valid reasons (NCC, NSS, Swach Bharat) or medical reasons. A student who has been awarded FA shall repeat the course when offered. The Principal/Head of the Department shall ensure that the candidate is informed about the lack of attendance before the commencement of end-semester examination and confirm that such candidates are not permitted to write the examination.

• To pass a course the student must secure minimum of 40 out of 100 marks (40%) in the internal and the end-semester examination put together.

SUPPLEMENTARY EXAMINATION

• A failed student who meets the attendance requirement may be permitted to register for the next end-semester examination in the following semester itself.

• Students who have failed due to insufficient attendance and /or less than 40% Internal Assessment marks should repeat the course as and when offered.
SCHEME OF EXTERNAL EXAMINATION
(Theory Paper)

Duration of exam - 3 hours
Total Marks: 75
• Examinations shall be in two sections.
• Section-A for 15 Marks and Section-B for 60 Marks(15+60=75).

SECTION – A: (5 x 3 = 15 Marks)
• It is of short answer type. Each question carry 3 marks.
• 10 questions to be given by setting 2 questions from each unit.
• Candidate should Answer 5 questions out of 10 questions.

SECTION – B: (5 x 12 = 60 Marks)
• It is of essay answer type. Each question carry 12 Marks.
• 5 questions to be given on internal choice (either or type). One question from each unit. Candidate should answer ALL questions.

SCHEME OF EXAMINATION (Practical Paper)

Duration of exam - 3 hours

INTERNAL EXAMINATION
Maximum Marks: 25
• Model Internal Examination by the course teacher: 20 Marks.
• Practical observation: 5 Marks.

EXTERNAL EXAMINATION
Maximum Marks: 75
• Six questions to be set.
• Candidates should answer any four questions.

Marks for practical: 60.
• Each question carry 15 Marks.
• The scheme of evaluation for 15 Marks:
  ▪ for writing Aim: 2 Marks.
  ▪ for writing formula and procedures: 4 Marks.
  ▪ for making Calculations with excel: 6 Marks.
  ▪ for writing interpretation/inference: 3 Marks.

Marks for record: 15
• Record submission for practical paper is mandatory
# B.Sc. Degree Course

## Syllabus

(UG Programme in B.Sc. (Statistics) Degree Course)

To be implemented from 2017-18 Onwards

<table>
<thead>
<tr>
<th>COURSE</th>
<th>SUBJECT CODE</th>
<th>TITLE OF THE PAPER</th>
<th>CREDITS ALLOTED</th>
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<tr>
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<td>Theory Tutorial/Practical</td>
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<tr>
<td>DSC-1A</td>
<td>STAT 111</td>
<td>Basic Statistics</td>
<td>04</td>
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<td>Mathematics for Statistics</td>
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<td>DSC-1B</td>
<td>STAT 121</td>
<td>Probability Theory</td>
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<td>STAT 122</td>
<td>Distribution Theory</td>
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<tr>
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<td>STAT 123</td>
<td>Practical -2 (using MS Excel based on the courses Stat-121, Stat-122)</td>
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<td>Estimation Theory</td>
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<td>Real Analysis</td>
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<td>SEC-1</td>
<td>STAT 234</td>
<td>Programming in C</td>
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<td>Testing of Hypotheses</td>
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<td>STAT 242</td>
<td>Numerical Methods</td>
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<td>STAT 243</td>
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<td>STAT 244</td>
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<td>STAT 351</td>
<td>Data Analysis using SPSS</td>
<td>02</td>
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<td>STAT 352</td>
<td>Operations Research</td>
<td>04</td>
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<td>*DSE-2A</td>
<td>STAT 353</td>
<td>Stochastic Processes</td>
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<td>*DSE-3A</td>
<td>STAT 354</td>
<td>Applied Statistics</td>
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<td>GE-1</td>
<td>STAT 355</td>
<td>Sampling Methods</td>
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<td>STAT 356</td>
<td>Industrial Statistics</td>
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| SEMESTER – VI |                  |                    |        |                   |
| SEC-4  | STAT 361     | Statistics using R | 02     |                   |
| *DSE-1B| STAT 362     | Statistical Quality Control | 04 | 01       |
| *DSE-2B| STAT 363     | Regression Analysis | 04     | 01                |
| *DSE-3B| STAT 364     | Design of Experiments | 04 | 01        |
| GE-2   | STAT 365     | Project Work       | 06     |                   |
|        | STAT 366     | Data Base Management Systems | 03 |                   |

- **Total Number of Credits 120**
- *Any three papers can be selected from the pool of papers for DSE-1A, 2A, and 3A in the fifth semester and any three papers can be selected from the pool of papers for DSE-1B, 2B and 3B in the sixth semester, respectively.

## Distribution of Credits

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<td>SEC</td>
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<td>Discipline Specific Elective</td>
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Detailed and course wise Syllabus for B.Sc. Statistics

SEMMESTER – I

DSC-1A

STAT-111: BASIC STATISTICS

UNIT 1
Introduction to Statistics – Primary and Secondary data – Nominal, Ordinal, Ratio, and Interval scale (with examples) - Graphical Representation of data – Bar-charts, Pie-diagrams, Histograms, Frequency polygon, Ogives.

UNIT 2
Measures of central tendency – properties – merits and demerits – weighted means – graphical location of median, quartiles, deciles, percentiles, and mode – relation between arithmetic mean, geometric mean and harmonic mean.

UNIT 3
Measures of dispersion – characteristics – Coefficient of dispersion – Coefficient of variation – Moments – Relation between moments about mean in terms of moments about point – Pearson’s β and γ coefficients.

UNIT 4
Skewness and Kurtosis – Pearson’s coefficient of skewness – Bowley’s coefficient of skewness – coefficient of skewness based upon moments – Curve fitting – Principle of least squares – Fitting of straight line, parabola, exponential and power curve.

UNIT 5

Books for Study:
2. S.P.Gupta (2014), Statistical Methods, Sultan Chand & sons

Books for Reference:

Note to the paper setter : 100% Theory
SEMESTER – I

DSC-2A

STAT 112: MATHEMATICS FOR STATISTICS

UNIT I
Matrices: Elementary, scalar, Hermitian, skew-Hermitian, symmetric, skew-symmetric, Unitary, triangular, equivalent and similar matrices- Transpose and conjugate of a matrix – Rank of a matrix

UNIT II

UNIT III
Successive Differentiation – Leibnitz Theorem – Partial differentiation – Maxima and Minima of functions of two variables

UNIT IV
Integration – Properties of Definite Integrals – Reduction formula – Bernoulli’s formula

UNIT V

Books for Study:

1. Diagrammatic Representation  Bar Chart, Pie Diagram
2. Construction of Discrete and Continuous Frequency Tables from raw data
3. Graphical Representation - Histogram
4. Summary Statistics
5. Two way tables and plots
6. Simple correlation, Rank correlation
7. Partial and multiple correlation
8. Fitting of straight line, second degree
9. Fitting of exponential and power curves
SENDER – II

DSC-1B

STAT-121: PROBABILITY THEORY

UNIT 1
Introduction to probability theory – Random experiments, Events, Sample space, Algebra of events, Operations on events – Classical approach to probability – Axiomatic approach to probability – Simple problems.

UNIT 2

UNIT 3

UNIT 4
Mathematical Expectation of random variables and its properties - Moment generating function- Cumulant generating function – Characteristic function – Definition - their properties for discrete and continuous variates – Simple problems.

UNIT 5

Books for Study:

Books for Reference:

Note to the paper setter: 100% Theory
UNIT 1
Discrete Distributions – Uniform, Bernoulli, Binomial, Poisson, Negative Binomial, Geometric, Hypergeometric distribution and their characteristics – Simple problems (Mean and Variance).

UNIT 2
Continuous distribution - Uniform, Exponential, Gamma, Beta, Cauchy, Pareto Distributions – Characteristics Properties of these distribution – Simple problems

UNIT 3
Normal, Lognormal distributions and their characteristics properties - Bivariate Normal distribution – Marginal and conditional distribution – Simple problems.

UNIT 4
Sampling Distribution – t, F and Chi-square – derivation of their probability density functions – relation among t, F and chi-square distribution- characteristic properties of t, F and chi-square

UNIT 5

Books for Study:

Books for Reference:

Note to the paper setter : 100% Theory
1. Create a sample space, obtain random variables and also arrive to probability distributions in the case of (i) 4 coin tossing problem (ii) 2 dice throwing problem (iii) 2 dice and 2 coin tossing problem
2. Problem based on inverse probability/Bayes theorem
3. Computation of moments for discrete and Continuous Probability distribution function
4. Probability on joint, conditional and marginal distributions
4. Computation of probabilities of Binomial, Poisson and Normal Distribution
5. Discrete Distributions with simple problems
   1. Binomial Distribution
   2. Poisson Distribution
   3. Geometric Distribution
   4. Negative Binomial Distribution
   5. Normal Distribution
6. Continuous Distributions with simple problems
   a. Uniform Distribution
   2. Exponential Distribution
   3. Normal Distribution
   4. Bivariate Normal Distribution
UNIT 1


UNIT 2


UNIT 3

Methods of moments – Method of Maximum Likelihood (M.L.E.) – Properties of Maximum Likelihood Estimators (without proof) – Simple Problems

UNIT 4

Method of Least Squares – Method of Minimum Chi-square - Simple problems.

UNIT 5

Interval Estimation - Concepts of Confidence Interval and Confidence Coefficient - Confidence Intervals for mean, difference of means, Proportions (single and difference), ratio of variances of the parameters of univariate normal, two independent normal and one parameter exponential distribution – Large sample confidence interval.

Books For Study:


Books for Reference:


Note to the paper setter : 100% Theory
UNIT 1
Sequence of real numbers: Limit of a sequence - Convergent sequences, Divergent sequences - Bounded sequences - Monotone sequences – Cauchy’s first and second theorem on limits – Cauchy’s general principle of convergence

UNIT 2

UNIT 3
Functions: Limit of real valued function in one variable, continuity – types of discontinuities – algebra of continuous functions – Extreme value theorem – Intermediate value theorem – Uniformly Continuous functions

UNIT 4
Increasing and Decreasing functions – Differentiability – Darboux’sTheorm – Rolle’s Theorem – Mean value theorem for derivatives – Taylor’s Series expansion

UNIT 5
Riemann Integration – Definition and existence of the integral – refinement of partitions – Darboux’s theorem – Conditions of Integrability – Integrability of sum and modulus of integrable functions – Integration and Differentiation – Fundamental Theorem of Calculus

Books for Study:

Books for Reference :
1. Estimation of the parameters of the discrete and continuous distribution by the method of moments and method of maximum likelihood.

2. Confidence Intervals for the parameters (means, variances and proportions) of Normal distribution.
SEMESTER – III                                                        2 Credits

SEC-1

STAT 234 : PROGRAMMING IN C

UNIT 1
Introduction – C character set, Identifiers and keywords. Data Type, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, pre-processor commands, #include, define preparing and running a complete C program.

UNIT 2
Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional Operator, Library functions.

UNIT 3
Control statements: while, do-while statement, nested loops, if-else, nested if-else, switch, break, continue and goto statements, comma operator.

UNIT 4
Arrays: declaration of one and two dimensional arrays –Strings and operations on strings, String Library functions.

UNIT 5
Functions: Defining and accessing: Passing arguments, Call by reference, Call by Value, Function Prototypes, Recursion. Use of library functions. Structures, Array of Structures

Books for Study:

Books for Reference:

Questions on programs shall be on computing mean, median, correlations etc.,
UNIT 1

UNIT 2
Uniformly most powerful tests – definition and simple applications – Likelihood Ratio tests – Definition and simple applications.

UNIT 3
Test of significance: Exact and Asymptotic test based on Normal, Student’s t, Chi-square and F-distributions for testing the means, proportions, variances and correlation coefficient – Chi-square test of independence.

UNIT 4
Sequential tests – Need for sequential tests – Wald’s SPRT with illustrations – Approximate OC and ASN functions for tests regarding parameters of binomial and normal distributions.

UNIT 5

Books For Study:

Books for Reference:

Note to the paper setter: 100% Theory
STAT 242: NUMERICAL METHODS

UNIT 1

UNIT 2
Finite differences: Forward and backward differences – Differences of a polynomial – Relation between the Operators E, Δ, δ, μ and backward difference operator, and their basic properties – Application to summation of series.

UNIT 3
Interpolation with equal intervals: Newton’s forward and backward differences formulae. Central differences: Gauss’s forward and backward differences formulae – Stirling’s, Bessel’s and Laplace- Everett’s formula – Simple problems only.
Interpolation with unequal intervals: Divided differences and their properties – Newton’s divided difference formula – Lagrange’s formula – simple problems only.

UNIT 4

UNIT 5

Books for Study:

Books for Reference:
1. Scarborough B: Numerical Mathematical Analysis, OUP.
DSC-3D

STAT 243: PRACTICAL -4

(using MS Excelfor Stat-241& Programming in Cfor Stat-242)

Practical programs using MS Excel (STAT 242)

1. Large Sample Tests: Means, Variances and Proportions

2. Test based on Chi-square statistic: Population variance, testing the goodness of fit

3. Test based on t statistic: Single men, Difference of means, Paired t test, Correlation coefficient, Regression coefficient.

4. Test based on F statistic: Equality of two population variance


Practical programs using C (STAT 242)

6. Find the root using Bisection method
7. Find the root using Newton Rapson Method
8. To find the solution of simultaneous equation using gauss siedal iterative method
9. To interpolate the given data using Lagrange’s Interpolation formula
10. Evaluate the definite integral using Simpson1/3rd and 3/8th Rule
11. Evaluate the definite integral using trapezoidal rule
UNIT 1
Introduction to Object Oriented Programming (OOP), C++ programming basics, Tokens, Keywords and control statements: Identifiers- data types - basic, user-defined and derived data types- symbolic constants -variable declaration operators in C++, Scope resolution operator - manipulations - cost operators - operator overloading and precedence - control structures.

UNIT 2
Functions: Simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions, variable and storage classes.

UNIT 3
Classes and Objects: Class specification - member function - nesting and private member functions - array of objects - returning objects - constant member functions - Constructors and Destructors : default arguments - copy and dynamic constructors – destructors.

UNIT 4
Inheritance: Defining derived classes - single inheritance - multilevel and multiple inheritance - hierarchical and hybrid inheritance.

UNIT 5
Input/Output operators : console I/O -streams - stream classes - unformatted and formatted I/O - Files : Classes for files - opening and closing files - file modes - sequential I/O - updating files

Books for Study

Books for Reference
1. R. Venugopal: Mastering C++, Tata Mcgraw_Hill.
UNIT 1
Basic of SPSS – Importing and Exporting of files – Recoding and Computing new variables. Selection of cases – splitting and merging of files

UNIT 2
Graphical plots: Box Plot, Scatter plot, Histogram, Bar and Pie charts, Frequencies, Custom tables, Cross Tabulations.

UNIT 3

UNIT 4
Testing of Hypotheses – one sample, two sample and paired samples t-test; F-test for two sample variances; Chi-square test for independence of attributes. NP: Sign Test, Mann-Whitney U test, Wilcoxon-Sign rank test

UNIT 5
One way and Two Way Analysis of Variance, $2^2, 2^3, 3^2$ factorial designs

Books for Study

2. Robert Ho (2006), Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS, Chapman and Hall, CRC Press

Books for Reference

SEMESTER – V                                          4 Credits

DSE-1A
STAT 352: OPERATIONS RESEARCH

UNIT 1

UNIT 2
Linear Programming – Graphical Solution – Simplex method including artificial variable technique- Big M-Method and two-Phase methods – Principle of Duality

UNIT 3
Transportation Problem: Initial Basic Solution by North West Corner Rule, Least Cost and Vogel’s Approximation Methods – Optimal solution by Modified Distribution (MODI) Method – assignment problem – Simple problems

UNIT 4
Sequencing – ‘n’ jobs and 2 machine problem – ‘n’ jobs and ‘m’ machine problems – 2 jobs and ‘m’ machine problem – Game Theory – Optimal solution of two person zero sum games – mixed strategies – Graphical Solution of (2 x n) games – solution of (m x n) games by linear programming – dominance property.

UNIT 5
Network analysis by CPM / PERT: basic Concepts: Constructions of the network – Concepts of Slack and float in network analysis - Determination of the floats and critical path.

Books for study:

Books for Reference:

Note to the paper setter: 20% Theory and 80% Problems
UNIT 1
Definition of stochastic process - classification of stochastic processes according to time parameter and state space – examples of stochastic processes – definition of stationary process – stationary process with independent increments.

UNIT 2

UNIT 3
Classification of states of Markov chain, Basic limit theorem of Markov chain (statement only), stationary and limiting distribution for a Markov Chain – Existence of limiting distribution.

UNIT 4

UNIT 5
Characteristics of queuing models - Busy period– Simple queuing models M/M/1– Simple problems

Books for Study

Books for Study and Reference:

Note to the paper setter : 100% Theory
UNIT 1

UNIT 2
Seasonal indices – Simple average, Ratio to moving average – Ratio to trend and link relative method – Cyclic fluctuations – residual method only – Variate difference method.

UNIT 3
Definition of Index numbers – Weighted and unweighted index numbers – Laspeyre’s, Paasche’s, Fisher’s, Marshall – Edeworth index number – optimum tests for index numbers, fixed and chain base index numbers – cost of living number – construction and uses

UNIT 4

UNIT 5

Books for Study:

Note to the paper setter: 60% Theory and 40% Problems
UNIT 1
Concept of sampling – Need for sampling – Population and sample – sampling unit and sample frame – types of population – basic properties of population – sample survey and census – Principal steps in a Sample Survey – Notion of sampling error.

UNIT 2
Simple random sampling with and without replacement – Estimation of Population mean and proportion and their variances

UNIT 3

UNIT 4
Systematic Sampling – Estimation of population mean and its sampling variance – comparison of systematic, simple random and stratified random sampling

UNIT 5
Cluster sampling with equal sized clusters – estimation of population mean and variance.

Books for study:

Books for Reference:

Note to the paper setter : 80% Theory and 20% Problems
UNIT 1
Inventory planning: Concept of planned inventory policies Deterministic models. Policy when inventory levels are reviewed continuously and demands occur uniformly with and without shortage costs Economic order quantity.

UNIT 2
Policy for production planning when inventory levels are reviewed periodically Stochastic models. Single period model with no set up cost having zero or nonzeroinitial stock (s,S) policy. Solving special cases using computer packages.

UNIT 3
Forecasting: Concept of forecasting and its applications in manufacturing and nonmanufacturing industrial situations Different methods of forecasting including average, last value, weighted average exponential smoothing. Forecasting in presence of linear trends using least square methods Forecasting in presence of seasonal effects. Solving special cases using computer package.

UNIT 4
Reliability: Definitions and relationships between survival function, hazard, function, hazard rate of a non-negative random variable parametric distributions: Weibull, Gamma, Lognormal and Exponential as life timedistributions - Concept of aging, IFR, FRA classes of distributions and their dual.

UNIT 5
Coherent system as binary function: Minimal cut and path sets(vectors) Representation of structure function of series, parallel and t out of n: G systems of independent components Minimal cut and path structure functions Dual of a coherent structure Derivation of reliabilities of above structures.

Books for study:

Books for Reference:
UNIT 1
Introduction to R: R as a calculator, statistical software and a programming language, R preliminaries, getting help, data inputting methods (direct and importing from other spreadsheet applications like Excel), data accessing, and indexing, Graphics in R, built in functions, saving, storing and retrieving work.

UNIT 2
Descriptive statistics: diagrammatic representation of univariate and bivariate data, measures of central tendency, partition values, measures of dispersion, summaries of a numerical data, skewness and kurtosis, random sampling with and without replacement.

UNIT 3
Probability Distributions: R as a set of statistical tables- cumulative distribution, probability density function, quantile function, and simulate from the distribution, plotting probability curves for standard distributions.

UNIT 4
Statistical Inference: One- and two-sample tests, z-test, t-test, F-test, chi-square test of independence and goodness of fit, interval estimation for mean, difference of mean and variance, tests for normality.

UNIT 5
Analysis of Variance – correlation – Simple and Multiple regressions

Books for Study
1. Dr. Mark Gardener, Beginning R The statistical Programming Languages, John Wiley & Sons (2012).

Books for References:
UNIT 1
Concept of Quality – Quality movement in India – Standardization for Quality – Quality movement – Quality management – Quality circles

UNIT 2
Need for SQC in industries – process control – chance and assignable causes of variations – concepts of specification and tolerance limits – process capability – statistical basis for control charts –

UNIT 3
Control chart for variables – X bar and R chart - their construction and analysis.
Control charts for attributes – p, np, c and U charts – their construction and analysis.

UNIT 4
Product control – fundamental concepts of acceptance sampling by attributes – producer’s and consumer’s risk – concepts of AQL, LTPD, AQL and AOQL – Single sampling plan OC, AOQ, ASN, ATI curves.

UNIT 5
Double sampling plan for attributes – OC, AOQ, ASN, ATI curves – Dodge and Romig tables – Sequential sampling plan for attributes.

Books for Study

Books for Reference

Note to the paper setter : 60% Theory and 40% Problems
UNIT 1

UNIT 2

UNIT-3
Multiple regression model: Description of data model – Properties of least square estimators – Predicted values and standard errors – Multiple correlation coefficient –Selection of variables – Forward selection procedure – Backward elimination procedure – Stepwise method (algorithms only).

UNIT 4
Test of hypothesis on the linear model – Assumption about the explanatory variable – Testing a subset of regression coefficients equal to zero – Testing of equality of regression coefficients.

UNIT 5

Books for study
1. S.Chatterjee and B.Price(1977): Regression Analysis by Example, John Wiley & Sons, New York. Chapter 1,2,3 and relevant portions in chapters 4,5,6,7,8,9

Books for Reference:

Note to the paper setter: 80%Theory and 20% Problems
UNIT 1
Basic principles for designing statistical experiments: Randomisation, Replication and local control techniques; determination of experimental units and notion of experimental error. Analysis of variance with one way – Two way classification; Models and estimation of parameters

UNIT 2
Completely randomized – Models and estimates of parameters and their standard error – Analysis of data arising from such design, multiple comparison tests: LSD

UNIT 3
Randomized block design - Models and estimates of parameters - Estimation of one and two missing observations – efficiency of RBD relative to CRD -

UNIT 4
Latin Square Design – Models and estimates of parameters - Estimation of one and two missing observations – Efficiency of LSD relative to CRD and RBD

UNIT 5
Factorial Experiments: $2^2$, $2^3$ and $3^2$ designs; estimation of main effects and interactions and their standard errors.

Books for study:

Books for Reference:

Note to the paper setter: 80% Theory and 20% Problems
DSE-4B
STAT 365: PROJECT WORK

Guidelines for the Project work:

1. A project work shall be normally offered in the third year (sixth semester).
2. A project work shall be assessed for a maximum of 100 marks. The assessment will be based on the project report, presentation and viva-voce.
3. A project may be undertaken by a group of students and the maximum number of students in a team shall not exceed five. However, the project report shall be submitted by each member of the team separately.
4. A project work shall be supervised by a faculty member assigned by the Head of the Department.
5. There shall be an internal examiner for the evaluation of the project work.
6. A project work should encourage a student to be able to interact with the end user.
7. A project work should be chosen such that there is enough scope to apply and demonstrate the statistical techniques learnt in the course.

A project work report shall clearly state the problem addressed, the methodology adopted, the assumptions and the hypotheses formulated, any previous references to the study undertaken, statistical analyses performed and the broad conclusion drawn.
SEMESTER – VI

3 Credits

GE-2

STAT 366: DATABASE MANAGEMENT SYSTEMS

UNIT 1
Introduction - DBMS Basic Concepts - Purpose of Database Systems Database System / File System - Overall System architecture Database Languages Classifications Data Models

UNIT 2
Entity relationship model: Mapping constraints Primary Keys Foreign Keys Structural Constraints. ER notations - ER model examples Enhanced Entity Relationship Model: EER Concepts like Generalization, Specialization, Union, Category, Disjoint, Overlapping etc. EER model examples

UNIT 3

UNIT 4
SQL Basics of SQL DDL DML DCL TCL Commands in detail with examples

UNIT 5

Books for study:

Books for Reference:
1. RamezElmasri and B. Navathe, Fundamentals of Database Systems (Chapters1, 2, 3, 4.1, 7, 8, 9, 14), 3/e, Addison Wesley.