



ST ALOYSIUS

(DEEMED TO BE UNIVERSITY)

MANGALURU 575003 – INDIA

Re-accredited by NAAC "A++" Grade

Course Structure and Syllabus of

First Year UG

STATISTICS

B. Sc. Statistics Syllabus

A meeting of the Academic Advisory Committee in Statistics was held on 13-04-2024.

Members Present

1. Dr. Aruna Kalkur T (Chairperson), Professor of Statistics, St Aloysius Deemed to be University, Mangaluru.
2. Dr. Savitha Kumari, Associate Professor of Statistics, NMAM First Grade College, Nitte
3. Mr. Umesh Pai, Associate Professor of Statistics, MGM College, Udupi
4. Ms. Stephil M. P., Lecturer in Statistics, St Aloysius Deemed to be University, Mangaluru
5. Ms. Shwetha Bangera, Lecturer in Statistics, St Aloysius Deemed to be University, Mangaluru

Agenda

- 1. Discussion and approval of I and II semester syllabus.**
- 2. Discussion and approval of Certificate course syllabus.**
- 3. Any other matter with the permission of chair.**

Program Outcomes

By the end of the program the students will be able to:

1. Acquire a fundamental/systematic or coherent understanding of the academic field of Statistics and its different learning areas and applications.
2. Develop and demonstrate an ability to understand major concepts in various disciplines of Statistics.
3. Demonstrate the ability to use skills in Statistics and different practicing areas for formulating and tackling Statistics related problems and identifying and applying appropriate principles and methodologies to solve a wide range of problems associated with Statistics.
4. Plan and execute Statistical experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate statistical software including programming languages, and report accurately the findings of the experiment/investigations.
5. Have knowledge regarding the use of data analytics tools like Excel and R- programming.
6. Recognize the importance of statistical modeling and computing, and the role of approximation and mathematical approaches to analyze real problems using various statistical tools.
7. Demonstrate relevant generic skills and global competencies such as (i) Problem-solving skills that are required to solve different types of Statistics related problems with well-defined

solutions, and tackle open-ended problems, that belong to the disciplinary-area boundaries.

Summary of Discipline Specific Courses (DSC)			
Semester	Course Code	Title of the Paper	Credits
I	DSC B1	Descriptive Statistics	4
		Practical based on DSC B1	2
II	DSC B2	Probability and Discrete Distributions	4
		Practical's based on DSC B2	2

Course Code	Title of course	Category of course	Teaching hours per week	SE E	CIE	Total Marks	Credits
SEMESTER I							
G 506 DC1.1	Descriptive Statistics	DSC	04	60	40	100	4
G 506 DC2.1 P	Practical G 506 DC1.1	DSC	04	60	40	100	2
G 506 OE1.1	Statistical Methods	OEC	03	60	40	100	2
SEMESTER II							
G 506 DC1.2	Probability and Discrete Distributions	DSC	04	60	40	100	4
G 506 DC2.2 P	Practical G 506 DC1.2	DSC	04	60	40	100	2
G 506 OE1.2	Applied Statistics	OEC	03	60	40	100	2

B.Sc. Semester 1

Course Title: Descriptive Statistics	
Total Contact Hours: 56	Course Credits:04
Formative Assessment Marks: 40	Duration of ESA/Exam: 2.5 hours
Model Syllabus Authors: State-level NEP-model curriculum setting committee members-Statistics	Summative Assessment Marks: 60

**Title of the Course: Descriptive Statistics
506 DC1.1**

Course Code: G

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours/semester
4	56	2	52

Content of Theory Course 1	56 Hrs
Unit – 1: Introduction to Statistics	14 Hrs
Statistics: Definition and scope. Concepts of statistical population and sample (SRS, Stratified, Systematic and Cluster sampling methods Definitions only). Data: quantitative and qualitative, cross-sectional and time-series, discrete and continuous. Scales of measurement: nominal, ordinal, interval and ratio. Presentation of data: tabular and graphical. Frequency distributions, cumulative frequency distributions and their graphical representations.	
Unit – 2: Univariate Data Analysis	14 Hrs
Measures of Central Tendency: Mean, weighted mean, trimmed mean, Median, Mode, Geometric and harmonic means, properties, merits & limitations and relation between these measures. Measures of Dispersion: Range, Quartile deviation, Mean deviation, Standard deviation and their relative measures. Gini's Coefficient, Lorenz Curve. Moments, Skewness and Kurtosis. Quantiles and measures based on them. Box Plot. Outliers. Chebyshev's inequality, normal data sets.	
Unit – 3: Bivariate Data Analysis	14 Hrs
Bivariate Data, Scatter plot, Correlation, Karl Pearson's correlation coefficient, Properties of correlation coefficients with proof, Rank correlation – Spearman's and Kendall's measures. Concept of errors, Principle of least squares, fitting of polynomial and exponential curves. Simple linear regression and its properties. Fitting of the linear regression line and coefficient of determination. Properties of regression coefficients and regression lines.	
Unit –4: Multivariate Data Analysis	14 Hrs
Analysis of Categorical Data: Contingency table, independence and association of attributes, measures of association - odds ratio, Pearson's and Yule's measure, Multivariate Frequencies, Multivariate Data Visualization, mean vector and dispersion matrix, Multiple linear regression.	

References

1. Agresti, A. (2010), Analysis of Ordinal Categorical Data, 2nd Edition, Wiley.
2. Anderson T.W. and Jeremy D. Finn (1996), The New Statistical Analysis of Data, Springer.
3. Gupta, S.C. (2023), Fundamental of Statistics, Himalaya Publishing House, 8th Edition.
4. Gupta S.C. and V.K. Kapoor (2018), Fundamental of Applied Statistics, Sultan Chand & Sons
5. Gupta S.C. and V.K. Kapoor (2020), Fundamental of Mathematical Statistics, Sultan Chand and Co. 12th Edition.
6. Hogg, R. V. McKean J. W. and Craig, A. T. (2012), Introduction to Mathematical Statistics, Pearson 7th Edition.
7. Joao Mendes Moreira, Andre C P L F de Carvalho, Tomas Horvath (2018), General Introduction to Data Analytics, Wiley.
8. Johnson, R.A. and Bhattacharyya, G.K. (2006), Statistics: Principles and methods. 5th Edition,

John Wiley & Sons, New York.
9. N G Das (2017), Statistical Methods, ISBN-13: 978-0070083271

Pedagogy

1. The course is taught using the traditional chalk and talk method using problem solving through examples and exercises.
2. Students are encouraged to use resources available on open sources.

Content of Practical Course 1 G 506 DC1.1P

(Computing all the practical's manually (2 hrs.) and using Excel (2 hrs.))

1. Presentation of data by frequency tables, diagrams & graphs, stem & leaf and partition values.
2. Arithmetic Mean (AM), geometric mean, harmonic mean, weighted AM, trimmed mean, corrected mean.
3. Mode, median and partition values.
4. Absolute and relative measures of dispersion, Box plots.
5. Problems on moments, skewness and kurtosis.
6. Fitting of curves by least squares method.
7. Product moment correlation coefficient and rank correlation.
8. Regression of two variables.
9. Multivariate Regression.
10. Problems on the Association of attributes.

Statistical Methods (Open Elective)

G 506 OE1.1

Course Objectives

1. This is an open elective course for other than statistics students.
2. The students will learn the elements of descriptive statistics, probability, and statistical methods such as tests of hypotheses, correlation and regression.

Course Outcomes

Students will be able to

- CO1. Acquire knowledge of statistical methods.
- CO2. Identify types of data and visualization, analysis and interpretation.
- CO3. Know about elementary probability and probability models.
- CO4. Employ suitable test procedures for the given data set.

Pedagogy

The course is taught using the traditional chalk and talk method using problem-solving through examples and exercises. Students are encouraged to use resources available on open sources.

Statistical Methods	G 506 OE1.1	42 Hrs
Unit –1: Introduction		14 Hrs
Definition and scope of Statistics. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Presentation: tabular and graphic, including histogram and ogives. Concepts of statistical population and sample. Sampling from finite population - Simple random sampling, Stratified and systematic random sampling procedures (definitions and methods only). Concepts of sampling and non-sampling errors.		
Unit –2: Univariate and Bivariate Data Analysis		14 Hrs
Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis. Bivariate data, scatter diagram, Correlation, Karl Pearson’s correlation coefficient, Rank correlation. Simple linear regression, the principle of least squares and fitting of polynomials and exponential curves.		
Unit –3: Probability and Distributions		14 Hrs
Probability: Random experiment, trial, sample space, events-mutually exclusive and exhaustive events. Classical, statistical and axiomatic definitions of probability, addition and multiplication theorems. Discrete and continuous random variables, probability mass and density functions, distribution functions, and expectation of a random variable. Standard univariate distributions: Binomial, Poisson and Normal distributions (Elementary properties and applications only).		

References

1. Anderson T.W. and Jeremy D. Finn (1996), The New Statistical Analysis of Data, Springer.
2. Daniel, W. W. (2007), Biostatistics - A Foundation for Analysis in the Health Sciences, Wiley.
3. Cochran, W G (1984), Sampling Techniques, Wiley Eastern, New Delhi.
4. Gupta, S.C. (2023), Fundamental of Statistics, Himalaya Publishing House, 8th Edition.
5. Gupta S.C. and V.K. Kapoor (2018), Fundamental of Applied Statistics, Sultan Chand & Sons

6. Gupta S.C. and V.K. Kapoor (2020), Fundamental of Mathematical Statistics, Sultan Chand and Co. 12th Edition.
7. Mukhyopadyaya P (1999), Applied Statistics, New Central Book Agency, Calcutta.

B.Sc. Semester 2

Course Title: Probability and Distributions	
Total Contact Hours: 56	Total Contact Hours: 56
Formative Assessment Marks: 30	Formative Assessment Marks: 30
Model Syllabus Authors: State-level NEP-model curriculum setting committee members-Statistics	Model Syllabus Authors: State-level NEP-model curriculum setting committee members-Statistics

Course Pre-requisite(s): II PUC with Mathematics

Title of the Course: Probability and Distributions

G506 DC1.2

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours/semester
4	56	2	52
Content of Theory Course 2			56 Hrs
Unit –1: Probability			14 Hrs
Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability–classical, statistical, and axiomatic. Conditional Probability, Boole’s inequality with proof, laws of addition and multiplication with proof, independent events, theorem of total probability, Bayes’ theorem and its applications.			
Unit –2: Random Variables and Mathematical Expectation			14 Hrs
Definitions of discrete and continuous random variables, Distribution function, probability mass and density functions – properties and illustrations, Expectation of a random variable and rules of expectation and related results, Moments and moment generating function – properties and uses.			
Unit –3: Standard Distributions			14 Hrs
Bernoulli, Binomial, Poisson - mean, variance, moments and m. g. f. recursive relations for probabilities. Discrete Uniform, Negative Binomial, Geometric, Hyper-Geometric distributions – mean and variance. Applications of all these distributions.			
Unit –4: Data Analysis Using R			14 Hrs
Introduction to R: Installation, command line environment, an overview of capabilities, brief mention of open-source philosophy. R as a calculator: The four basic arithmetic operations. Use of parentheses nesting up to arbitrary level. The power operation. Evaluation of simple expressions. Quotient and remainder operations for integers. Standard functions, e.g., sin, cos, exp, log. The different types of numbers in R: Division by zero leading to Inf or -Inf. NaN. NA. No need to go into details. Variables. Creating a vector using c (), seq() and colon operator. How functions map over vectors. Functions to summarize a vector: sum, mean, sd, median, etc. Extracting a subset from the vector (by index, by the property). R as a graphing calculator: Introduction to plotting. Plot (),			

lines (), abline(). No details about the graphics parameters except colour and line width. Barplot, Pie chart and Histogram. Box plot. Scatter plot and simple linear regression using lm(y~x). Problems on discrete and continuous probability distributions.	
--	--

References

1. Gupta. S.C and V.K. Kapoor (2020), Fundamentals of Mathematical Statistics, Sultan Chand and Co, 12th Edition.
2. Gupta. S.C (2023), Fundamentals of Statistics, ISBN-13: 978-9356937499, Himalaya Publishing House, 8th Edition.
3. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009), Probability and Statistical Inference, Seventh Edition, Pearson Education, New Delhi.
4. Mood, A.M., Graybill, F.A. and Boes, D.C. (2007), Introduction to the Theory of Statistics, 3rd Edition. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
5. Ross, S.M. (2014), Introduction to Probability and Statistics for Engineers and Scientists, 5th Edition, Academic Press.
6. Sudha G. Purohit, Sharad D. Gore, Shailaja R Deshmukh (2009), Statistics Using R, Narosa Publishing House.
7. TKV Iyengar, B Krishna Gandhi, S Ranganath, MVSSN Prasad (2022), Probability and Statistics, ISBN-13:978-9355010643, Sultan Chand & Sons.
8. R for beginners by Emmanuel Paradis (freely available at https://cran.r-project.org/doc/contrib/Paradisrdebuts_en.pdf)

Content of Practical Course 2:

List of Experiments to be conducted (Computing all the practical's manually and using Excel/R)

1. Computing probability: using addition and multiplication theorems.
2. Conditional probability and Bayes' theorem.
3. Two exercises on Descriptive statistics (Presentations, Summarizations, correlations, regression and Graphs using R)
4. Problems on pmf, expectation, variance, quintiles (Discrete Case).
5. Problems on pdf, expectation, variance, quintiles (Continuous case).
6. Problems on discrete probability distributions (Binomial, Poisson, Negative – Binomial, Geometric, and discrete uniform).
7. Computation of moments and Moment generating functions (Discrete and Continuous Case).
8. Fitting of Binomial distribution.
9. Fitting of Poisson distribution.
10. Generation of random samples. (Binomial, Poisson, Geometric Distributions)

Applied Statistics (Open Elective)

G 506 OE1.2

Course Objectives

1. To enable the students to use statistical tools in finance, industries, population studies and health sciences.
2. To acquire knowledge about sampling methods for surveys.

Course Outcomes (CO)

Upon successful completion of this course, the student will be able to:

CO1. Understand the Price and Quantity Index numbers and their different measures and understand the applicability of the cost-of-living Index number.

CO2. Know the components & need for Time series and understand the different methods of studying trends and Seasonal Index.

CO3. Study the concept of vital statistics, sources of data and different measures of Fertility and Mortality and understand the Growth rates- GRR and NRR and interpretations.

CO4. Know the concept of Population, Sample, Sampling unit, sampling design, sampling frame, sampling scheme, need for sampling, apply the different sampling methods for designing and selecting a sample from a population, explain sampling and non-sampling errors.

CO5. Describe the philosophy of statistical quality control tools as well as their usefulness in industry and hence develop quality control tools in a given situation.

Applied Statistics	G 506 OE1.2	42Hrs
Unit –1: Index numbers		16 Hrs
Definition, Criteria for a good index number and different types of index numbers. Construction of index numbers of prices and quantities, consumer price index number. Uses and limitations of index numbers. Consumer price index number: Construction of consumer price index numbers. Applications of consumer price index numbers.		
Unit-2: Time Series Analysis		16 Hrs
Components of time series, Decomposition of time series- Additive and multiplicative model with their merits and demerits, Illustrations of time series. Measurement of the trend by method of the free-hand curve, method of semi-averages and method of least squares (linear). Measurement of seasonal variations by the method of ratio to trend.		
Unit –3: Vital Statistics		16 Hrs
Sources of demographic data, errors in data. Measurement of mortality: crude death rate, specific death rates and standardized death rates, infant mortality rate, maternal mortality rate, neonatal mortality rates, merits and demerits and comparisons of various mortality rates. Measurement of Fertility and Reproduction: Fecundity, fertility, measurement of fertility, crude birth rate, general fertility rate, age-specific fertility rate and total fertility rates, merits and demerits of each measure of fertility, comparative study of these measures of fertility, Growth rates: Gross reproduction rate and Net reproduction rates.		

References

1. Chatfield C. (1980), Analysis of Time Series –An Introduction, Chapman
2. Irwin Miller, John E Freund and Richard A Johnson (1992), Probability and Statistics for Engineers, Prentice Hall of India New Delhi.

3. J. Medhi (1992), Statistical Methods, New Age International (P) Ltd. New Delhi.
4. Kendall M.G. (1976), Time Series, Charles Griffin.
5. M.N. Das (1993), Statistical Methods and Concepts, Wiley Eastern Ltd.
6. Mukhopadhaya P (1998), Theory and Methods of Survey Sampling, Prentice Hall of India.
7. Mukhopadhyay P. (2011), Applied Statistics, 2nd ed. Revised reprint, Books and Allied.
8. S.C. Gupta (2022), Statistical Methods, Sultan Chand & Company, 11th Ed.

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Test 1	15
Internal Test 2	15
Assignment/Seminar (7 marks)+Attendance(3marks)	10
Total	40

Question Paper Pattern

2 Marks	Answer 5 out of 7	2x5=10
10 Marks	Answer 5 out of 7	10x5=50
	Total marks	60

Statistics Certificate Courses

1. An Introduction to R Programming

Objectives

1. To demonstrate R system installation and configuration of R-Environment and R-Studio.
2. To explore the usage of R documentation.
3. To examine R for mathematical operations.
4. To understand patterns, finding relationships and making useful conclusions.
5. To visualize the data using R with different types of graphs and charts.

Learning Outcomes

At the end of this course, the learners will be able to

1. List motivation for learning R programming language. ❖ Import new function packages into the R workspace using R-Studio.
2. Import, review and summarize data sets in R.
3. Create and edit visualizations of R.
4. Understand the importance of making meaningful conclusions.

Duration/Online lectures/ assignments/ Tests

Total duration: 20+10 hours, Online lectures: 12 hours, Assignment: 10 hours, Quizzes: 4 hours, End of the course test: 4 hours

Course content

Unit I

Introduction to R and R-Studio: Statistical programming and R Programming, Installation of R and R-Studio, Why R and R Studio?, Mathematical operations using R, Shortcut options in R., Functions in R. Session management.

Unit II

Data types in R: Vectors - Creating a vector, extracting elements from a vector, vector arithmetic, and character vector, Factors - Creating factors, summary of factors, Arrays - Creating arrays, sorting of an array, Lists - Creating a list, adding names to the list, calling an item from the list. Matrices - Constructing matrix objects, accessing matrix elements, naming the rows and columns of a matrix, reading a particular item from the matrix, matrix properties and matrix arithmetic. Data frames - Creating a data frame, summary of data frames, various data frames in R, summary for built in data frames.

Unit III

Correlation analysis and Linear regression: Performing correlation and regression analysis using R, interpreting results from correlation and regression analysis.

Visualization techniques using R: Bar charts-Simple bar chart, Component bar chart, Percentage bar chart, Multiple bar chart, Pie chart, Histogram, Box plot, Scatter plots.

Testing/Evaluation pattern: Total marks: 100, Assignments: 55, Tests: 20, Final Exam: 25

2. An Introduction to SPSS

Objectives

1. To provide transferable skills in analysing the data using SPSS.
2. To explore the usage of SPSS, as a tool to summarize and aid in the interpretation of data.
3. To perform descriptive analysis using SPSS.
4. To visualize the data using SPSS with different types of graphs and charts.
5. To perform comparative analyses using t-tests, ANOVA.

Learning Outcomes

At the end of this course, the learners will be able to:

1. Understand to enter and reorganize information within SPSS.
2. Import, review and summarize data sets using SPSS.
3. Create and edit visualizations using SPSS.
4. Understand and interpret charts using SPSS

5. Carry out inferential statistical analysis using SPSS.

Course Duration: Practical session / assignments / Tests

Theory session: 10 hours, Practical session: 15 hours, Assignment: 5 hours, **Total: 30 hours**

Course content

Unit I

Introduction to SPSS: SPSS Environment: Data Editor, Output Viewer, Data View Window, SPSS Syntax. Description of SPSS menu, Data Creation, import data from other data source, variable types in SPSS and Defining variables. Labelling for dummy numbers, recoding of the variables, transpose of data, insert variables and merge variables and cases.

Unit II

Exploring Data: Descriptive Statistics: Measures of Central tendency and Dispersion. Diagrammatic representation: Simple bar diagram, Multiple bar diagram, Sub-divided bar diagram, Percentage bar diagram, Pie diagram, Frequency table, Histogram, Scatter diagram, Box plot.

Unit III

Statistical tests using SPSS: Correlation, simple linear regression, multiple linear regression. Inferential Statistics: One sample t test, paired t test, independent sample t test, One way ANOVA, Chi square test for Independence.

3. An Introduction to Python

Objectives

- ❖ To demonstrate Python installation and setup Python.
- ❖ To explore Python versus other programming languages.
- ❖ To understand the basic concepts in Python: Variables, Assigning values, Lines, Strings, Basic Operators, Functions etc.
- ❖ To explore the tools likes Lists, Tuples and Dictionaries.
- ❖ To execute Python scripts, display and get the input.
- ❖ To analyse the data using descriptive statistics and statistical tools.
- ❖ To visualize the data using Python with different types of graph and charts.

Learning Outcomes

At the end of this course, the learners will be able to:

- ❖ Create new variables, functions, strings and so on.
- ❖ Use various built in functions in Python.
- ❖ Create and edit visualizations using Python.
- ❖ Interpret charts and graphs using Python.
- ❖ Carry out the statistical analysis using Python.

Course Duration: Practical session / assignments / Tests

Theory session: 10 hours, Practical: 15 hours, Assignment: 5 hours, Total: 30 hours.

Course content

Unit I

Introduction to Python: Introduction to Python dictionary, various comments involved in Python, Use of multi-line statements, Quotations in Python, Multiple Assignments, **Python Operators:** Arithmetic operators, Comparison operators, Assignment operators, String Special operators, String formatting operators.

Unit II

Built-in Data Types: Variable names, Numeric Data Types- Floating point, Complex, Integers; Boolean data types, Strings, Lists, Tuples, Arrays & Matrices – One Dimensional & Two-Dimensional Arrays, accessing elements of an array, rounding of arrays- round, floor, ceil; Concatenation. **Data Type Conversion:** Defining a function, calling a function, Scope of variables, Global v/s Local variables.

Unit III

Python for Econometrics, Statistics & Data Analysis: Background, Conventions, Components of Python Scientific Stack- Python, NumPy, SciPy, matplotlib & sea born, pandas, stats models, jupyter notebook.

Descriptive Statistics: Mean, Median, Variance, Coefficient of variation Covariance, Correlation and Linear Regression.

Data Visualization in Python: Scatter Pot, Line Chart, Simple Bar Plot, Multiple Bar Plot, Component Bar Plot, Percentage Bar Plot, Pie Chart, Box Plot, Histogram.

4. An Introduction to Data Analysis Using Excel

Objectives

- ❖ To identify the components of excel sheet.
- ❖ To enter the data in excel sheet.
- ❖ To perform the basic statistical tasks in excel sheet.
- ❖ To visualize the data using excel with different types of graphs and diagrams

Learning Outcomes

At the end of this course, the learners will be able to:

- ❖ List motivation for learning MS Excel.
- ❖ Summarize the various statistical operations, range, formulas and data operations.
- ❖ Find, collect and organize the data.
- ❖ Understand the importance of making meaningful conclusions.

Duration/Offline lectures//assignments/Tests

Total duration: 30 hrs. Offline lectures: 12 hours, Assignment: 10 hours, Quizzes: 4 hours

Final Exam: 4 hours

Course Content

Unit 1

Introduction to Excel: To create a workbook, Enter texts, numbers and dates in worksheets, Edit cell contents, Excel shortcut keys and benefits, Create basic formulas, Name, open and save a workbook, Preview, print and close a workbook.

Unit 2

Measures of Central Tendency and Dispersion: Arithmetic mean, Geometric mean and Harmonic mean, median and mode, range, quartile deviation, Mean deviation, standard deviation and coefficient of variation.

Correlation analysis and linear regression: Performing correlation and regression analysis using Excel, Testing of Hypothesis; Large sample tests, Large sample t test for mean, two sample t-test, test for association of attributes and test for variance.

Unit 3

Visualization techniques using Excel: Bar charts -Simple bar chart, Component bar chart, Percentage bar chart, Multiple bar charts, Pie charts, Histograms, Frequency Polygon and Ogives.

Testing/Evaluation pattern

Total marks: 100, Assignments: 50, Tests: 20, Final Exam: 30
