ANDHRA KESARI UNIVERSITY

Programme: B.A. / B.Sc. Honours in Statistics (Major)

w.e.f. AY 2023-24

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Essentials and Applications of Mathematical, Physical and Chemical Sciences	3+2	4
		2	Advances in Mathematical, Physical and Chemical Sciences	3+2	4
	II	3	Descriptive Statistics	3	3
			Descriptive Statistics Practical Course	2	1
		4	Random Variables & Mathematical Expectations	3	3
			Random Variables & Mathematical Expectations Practical Course	2	1

COURSE 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL ANDCHEMICAL SCIENCES

Theory   Credits: 4   5 hrs/week

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.

2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations

3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.

4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5 To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

UNIT I: ESSENTIALS OF MATHEMATICS:

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitude form and conversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles **Vectors:** Definition of vector addition – Cartesian form – Scalar and vector product and problems **Statistical Measures**: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS:

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe

UNIT III: ESSENTIALS OF CHEMISTRY: :

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY:

Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.
 Ethical and social implications: Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

Recommended books:

 1. Functions of one complex variable by John.B.Conway, Springer- Verlag.

 2. Elementary Trigonometry by H.S.Hall and S.R.Knight

 3.Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.

 4.Basic Statistics by B.L.Agarwal, New age international Publishers

 5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman

 6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker

 7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.

 8. Physics for Technology and Engineering" by John Bird

 9. Chemistry in daily life by Kirpal Singh

 10. Chemistry of bio molecules by S. P. Bhutan

 11. Fundamentals of Computers by V. Raja Raman

 12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

STUDENT ACTIVITIES

UNIT I: ESSENTIALS OF MATHEMATICS:

1: Complex Number Exploration

Provide students with a set of complex numbers in both rectangular and polar forms.

They will plot the complex numbers on the complex plane and identify their properties

2: Trigonometric Ratios Problem Solving

Give students a set of problems that require the calculation of trigonometric ratios and their relations.

Students will solve the problems using the appropriate trigonometric functions (sine, cosine, tangent, etc.) and trigonometric identities.

3: Vector Operations and Applications

Provide students with a set of vectors in Cartesian form.

Students will perform vector addition and subtraction operations to find the resultant vectors.

They will also calculate the scalar and vector products of given vectors.

4: Statistical Measures and Data Analysis

Give students a dataset containing numerical values.

Students will calculate the mean, median, and mode of the data, as well as other statistical measures if appropriate (e.g., range, standard deviation).
They will interpret the results and analyze the central tendencies and distribution of the data.

UNIT II: ESSENTIALS OF PHYSICS:

1. Concept Mapping

Divide students into groups and assign each group one of the topics.

Students will create a concept map illustrating the key concepts, relationships, and applications related to their assigned topic.

Encourage students to use visual elements, arrows, and labels to represent connections and interdependencies between concepts.

2. Laboratory Experiment

Select a laboratory experiment related to one of the topics, such as motion of objects or electric and magnetic fields.
Provide the necessary materials, instructions, and safety guidelines for conducting the experiment.
Students will work in small groups to carry out the experiment, collect data, and analyze the results.

After the experiment, students will write a lab report summarizing their findings, observations, and conclusions.

UNIT III: ESSENTIALS OF CHEMISTRY

1: Chemistry in Daily Life Presentation

Divide students into groups and assign each group a specific aspect of daily life where chemistry plays a significant role, such as food and nutrition, household products, medicine, or environmental issues.
Students will research and create a presentation (e.g., PowerPoint, poster, or video) that showcases the importance of chemistry in their assigned aspect.
2: Periodic Table Exploration

Provide students with a copy of the periodic table.

Students will explore the periodic table and its significance in organizing elements based on their properties.
They will identify and analyze trends in atomic structure, such as electronic configuration, atomic size, and ionization energy.

3: Chemical Changes and Classification of Matter

Provide students with various substances and chemical reactions, such as mixing acids and bases or observing a combustion reaction.
Students will observe and describe the chemical changes that occur, including changes in color, temperature, or the formation of new substances.
4: Biomolecules Investigation

Assign each student or group a specific biomolecule category, such as carbohydrates, proteins, fats, or vitamins.
Students will research and gather information about their assigned biomolecule category, including its structure, functions, sources, and importance in the human body.

They can create informative posters or presentations to present their findings to the class.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

1: Interdisciplinary Case Studies

Divide students into small groups and provide them with interdisciplinary case studies that involve the interdisciplinary application of mathematics, physics, and chemistry.

Each case study should present a real-world problem or scenario that requires the integration of concepts from all three disciplines.

2: Design and Innovation Project

Challenge students to design and develop a practical solution or innovation that integrates mathematics, physics, and chemistry principles.
Students can choose a specific problem or area of interest, such as renewable energy, environmental conservation, or materials science.
3: Laboratory Experiments

Assign students laboratory experiments that demonstrate the practical applications of mathematics, physics, and chemistry.

Examples include investigating the relationship between concentration and reaction rate, analyzing the behavior of electrical circuits, or measuring the properties of materials.

.4: Mathematical Modeling

Present students with real-world problems that require mathematical modeling and analysis.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

1. Identifying the attributes of network (Topology, service provider, IP address and bandwidth of

2. your college network) and prepare a report covering network architecture.

3. Identify the types of malwares and required firewalls to provide security.

4. Latest Fraud techniques used by hackers**.**

COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICALAND CHEMICAL SCIENCES

Theory	Credits: 4	5 hrs/week

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.

2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.

3. Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.

3. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nanosensors. Explore the effects of chemical pollutants on ecosystems and human health.

4. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics.Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite)..

UNIT I: ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms – Point ofintersection of two straight lines

Limits and Differentiation: Standard limits – Derivative of a function –Problems on product ruleand quotient rule

Integration: Integration as a reverse process of differentiation – Basic methods of integration

Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose ofa matrix and determinants

UNIT II: ADVANCES IN PHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. **Recent advances in the field of nanotechnology**: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY:

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Mathematical Modelling applications in physics and chemistry

Application of Renewable energy: Grid Integration and Smart Grids,

Application of nanotechnology: Nanomedicine,

Application of biophysics: Biophysical Imaging, Biomechanics, Neurophysics,

Application of medical physics: Radiation Therapy, Nuclear medicine

Solid waste management, Environmental remediation- Green Technology, Water treatment.

UNIT V: Advanced Applications of computer Science

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

Recommended books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications

2. Calculus by Thomas and Finny, Pearson Publications

3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.

4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle

5. "Energy Storage: A Nontechnical Guide" by Richard Baxter

6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara

7. "Biophysics: An Introduction" by Rodney Cotterill

8. "Medical Physics: Imaging" by James G. Webster

9. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas

10. Nano materials and applications by M.N.Borah

11. Environmental Chemistry by Anil.K.D.E.

12. Digital Logic Design by Morris Mano

13. Data Communication & Networking by Bahrouz Forouzan.

STUDENT ACTIVITIES

UNIT I: ADVANCES IN BASIC MATHEMATICS

1: Straight Lines Exploration

Provide students with a set of equations representing straight lines in different forms, suchas slope-intercept form, point-slope form, or general form.

Students will explore the properties and characteristics of straight lines, including theirslopes, intercepts, and point of intersection.
2: Limits and Differentiation Problem Solving

Students will apply the concept of limits to solve various problems using standard limits.

Encourage students to interpret the results and make connections to real-world applications,such as analyzing rates of change or optimizing functions.

3: Integration Exploration
Students will explore the concept of integration as a reverse process of differentiation andapply basic methods of integration, such as the product rule, substitution method, or integration by parts.

Students can discuss the significance of integration in various fields, such as physics andchemistry
4: Matrices Manipulation

Students will perform operations on matrices, including scalar multiplication, matrixmultiplication, and matrix transpose.

Students can apply their knowledge of matrices to real-world applications, such as solvingsystems of equations or representing transformations in geometry.

UNIT II: ADVANCES IN PHYSICS:

1: Case Studies

Provide students with real-world case studies related to renewable energy, nanotechnology,biophysics, medical physics, or shape memory materials.
Students will analyze the case studies, identify the challenges or problems presented, andpropose innovative solutions based on the recent advances in the respective field.
They will consider factors such as energy generation, energy storage, efficiency, sustainability, materials design, biomedical applications, or technological advancements.
2: Experimental Design

Assign students to design and conduct experiments related to one of the topics: renewableenergy, nanotechnology, biophysics, medical physics, or shape memory materials.
They will identify a specific research question or problem to investigate and design anexperiment accordingly.

Students will collect and analyze data, interpret the results, and draw conclusions based ontheir findings.

They will discuss the implications of their experimental results in the context of recentadvances in the field.

3: Group Discussion and Debate

Organize a group discussion or debate session where students will discuss the ethical, social, and environmental implications of the recent advances in renewable energy, nanotechnology, biophysics, medical physics, and shape memory materials.

Assign students specific roles, such as proponent, opponent, or moderator, and provide them with key points and arguments to support their positions.

UNIT III: ADVANCES IN CHEMISTRY:

1. Experimental Design and Simulation

In small groups, students will design experiments or simulations related to the assigned topic.

For example, in the context of computer-aided drug design, students could design a virtualscreening experiment to identify potential drug candidates for a specific disease target.

For nano sensors, students could design an experiment to demonstrate the sensitivity andselectivity of nano sensors in detecting specific analytes.
Chemical biology-related activities could involve designing experiments to study enzyme-substrate interactions or molecular interactions in biological systems.
Students will perform their experiments or simulations, collect data, analyze the results, and draw conclusions based on their findings.

2. Case Studies and Discussion

Provide students with real-world case studies related to the impact of chemical pollutants onecosystems and human health.
Students will analyze the case studies, identify the sources and effects of chemical pollutants, and propose mitigation strategies to minimize their impact.

Encourage discussions on the ethical and environmental considerations when dealing withchemical pollutants.
For the dye removal using the catalysis method, students can explore case studies wherecatalytic processes are used to degrade or remove dyes from wastewater.

Students will discuss the principles of catalysis, the advantages and limitations of thecatalysis method, and its applications in environmental remediation.
3: Group Project

Assign students to work in groups to develop a project related to one of the topics.

The project could involve designing a computer-aided drug delivery system, developing anano sensor for a specific application, or proposing strategies to mitigate the impact of chemical pollutants on ecosystems.
Students will develop a detailed project plan, conduct experiments or simulations, analyzedata, and present their findings and recommendations.
Encourage creativity, critical thinking, and collaboration throughout the project.

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS &CHEMISTRY
1: Mathematical Modelling Experiment

Provide students with a mathematical modelling experiment related to one of the topics. Forexample, in the context of renewable energy, students can develop a mathematical model tooptimize the placement and configuration of solar panels in a solar farm.
Students will work in teams to design and conduct the experiment, collect data, and analyze the results using mathematical models and statistical techniques.
They will discuss the accuracy and limitations of their model, propose improvements, and

interpret the implications of their findings in the context of renewable energy or the specificapplication area.

2: Case Studies and Group Discussions

Assign students to analyze case studies related to the applications of mathematical modellingin nanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or water treatment.

Students will discuss the mathematical models and computational methods used in the case studies, analyze the outcomes, and evaluate the effectiveness of the modelling approach.

Encourage group discussions on the challenges, ethical considerations, and potential advancements in the field.

Students will present their findings and engage in critical discussions on the advantages andlimitations of mathematical modelling in solving complex problems in these areas.

3. Group Project

Assign students to work in groups to develop a group project that integrates mathematical modelling with one of the application areas: renewable energy, nanotechnology, biophysics,medical physics, solid waste management, environmental remediation, or water treatment.

The project could involve developing a mathematical model to optimize the delivery of radiation therapy in medical physics or designing a mathematical model to optimize wastemanagement practices. Students will plan and execute their project, apply mathematical modelling techniques,analyze the results, and present their findings and recommendations.

Encourage creativity, critical thinking, and collaboration throughout the project.

UNIT V: Advanced Applications of computer Science

Students must be able to convert numbers from other number system to binary numbersystems

1. Identify the networking media used for your college network

   Identify all the networking devices used in your college premises.

Theory	Credits: 3	3 hrs/week

I.   Learning Outcomes

After successful completion of the course students will be able to:

1. To acquaint with the role of statistics in different fields with special reference to business and economics.
2. To review good practice in presentation and the format most applicableto their own data.
3. To learn the measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
4. To familiar with the measures of dispersion throw light on reliability of average and control of variability.
5. To deal with the situation where there is uncertainty and to measure that uncertainty by using the probability, which is essential in all research areas.

II.   Syllabus

Unit – 1: Statistical Description of Data

Origin, history and definitions of Statistics. Importance, Scope and limitations Statistics. Function of Statistics – Collection, Presentation, Analysis and Interpretation. Collection of data - primary and secondary data and its methods. Classification of data – Quantitative, Qualitative, Temporal, Spatial. Presentation of data – Textual, Tabular – essential parts.

Unit – 2:

Measurement Scales – Nominal, Ordinal, Ratio and Interval. Frequency distribution and types of frequency distributions, forming a frequency distribution. Diagrammatic representation of data – Historiagram, Bar, Multiple bar and Pie with simple problems. Graphical representation of data: Histogram, frequencypolygon and Ogives with simple problems.

Unit – 3: Measures of Central Tendency (MCT)

Arithmetic Mean – properties, methods. Median, Mode, Geometric Mean (GM), Harmonic Mean (HM). Calculation of mean, median, mode, GM and HM for grouped and ungrouped data. Median and Mode through graph. Empirical relation between mean, media and mode. Features of good average.

Unit – 4: Measures of Dispersion

Concept and problems – Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non – Central moments and their interrelationship. Sheppard's correction for moments. Skewness and its methods, kurtosis.

Unit – 5: Elementary Probability

Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events, Addition and multiplication theorems of probability for 2 and for n events and simple problems. Boole's inequality, Bayes theorem and its applications in real life problems.

Practical   Credits: 1   2 hrs/week

Syllabus

1. Writing a Questionnaire in different situations.
2. Forming a grouped and ungrouped frequency distribution table.
3. Diagrammatic presentation of data – Bar, multiple Bar and Pie.
4. Graphical presentation of data – Histogram, frequency polygon, Ogives.
5. Computation of measures of central tendency – Mean, Median and Mode.
6. Computation of measures of dispersion – Q.D., M.D and S.D.
7. Computation of non-central, central moments, β_1 and β_2 for ungrouped data.
8. Computation of non-central, central moments, β_1 and β_2 and Sheppard's corrections for grouped data.
9. Computation of Karl Pearson's and Bowley's Coefficients of Skewness.

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

III.   References

1. S. C. Gupta & V. K. Kapoor: Fundamentals of Mathematical Statistics, Sultan   Chand   &   Sons, New Delhi.
2. O. P. Gupta: Mathematical Statistics, Kedar nath Ram nath & Co.
3. P. N. Arora & S. Arora: Quantitative Aptitude Statistics – Vol II, S. Chand & Company Ltd.
4. K. Rohatgi & Ehsanes Saleh: An Introduction to Probability and Statistics, John Wiley & Sons.

IV.   Suggested Co-curricular Activities:

1. Training of students by related industrial experts
2. Assignments including technical assignments if any.
3. Seminars, Group Discussions, Quiz, Debates etc. on related topics.
4. Preparation of audio and videos on tools of diagrammatic and graphical representations.
5. Collection of material/figures/photos/author photoes of related topics.
6. Invited lectures and presentations of stalwarts to those topics.
7. Visits/field trips of firms, research organizations etc.

COURSE 4: RANDOM VARIABLES AND MATHEMATICAL EXPECTATIONS

Theory   Credits: 3   3 hrs/week

I.   Learning Outcomes

After successful completion of the course students will be able to:
1. To acquaint with the role of statistics in dealing with the univariate random variables.
2. To learn the extension of the univariate data to bivariate data.
3. To learn the measure of randomness mathematically by using expectations.
4. To get the familiarity about the generating functions, law of large numbers and central limit theorem, further to apply in research and allied fiends.

II.   Syllabus

Unit – 1: Univariate Random Variables
Definition of random variable (r.v.), discrete and continuous random variables, functions of random variable. Probability mass function, Probability density function, Distribution function and itsproperties. Calculation of moments, coefficient of skewness and kurtosis for a given pmf and pdf.

Unit – 2: Bivariate Random Variables
Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables and simple problems.

Unit – 3: Mathematical Expectation
Mathematical expectation of function a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Properties of expectations, variance, covariance. Chebyshev and Cauchy - Schwartz inequalities and their applications

Unit – 4: Generating functions
Definitions of Moment Generating Function, Cumulant Generating Function, Characteristic Function and Probability Generating Function and their properties.   Weak Law of Large Numbers (WLLN), Strong Law of Large Numbers (SLLN).

Unit – 5: Limit Theorems
Concept – Population, Sample, Parameter, statistic, Sampling distribution, Standard error. Convergence in probability and convergence in distribution, concept of Central limit theorem. Lindberg – Levy CLT and its applications, Statement of Lyapunov's CLT, relationship between CLT and WLLN.

COURSE 4: RANDOM VARIABLES AND MATHEMATICAL EXPECTATIONS

Practical   Credits: 1   2 hrs/week

Syllabus

1. Calculation of moments of univariate random variable to the given pmf.
2. Calculation of coefficient of skewness and kurtosis of univariate random variable to the given pmf.
3. Calculation of moments of univariate random variable to the given pdf.
4. Calculation of coefficient of skewness and kurtosis of univariate random variable to the given pdf.
5. Problem related to jpmf, mpmf and conditional pmf and its independence.
6. Problem related to jpdf, mpdf and conditional pdf and its independence.
7. Chebyshev's inequality application oriented problems.

III.   References
1. S. C. Gupta & V. K. Kapoor: Fundamentals of Mathematical Statistics, Sultan   Chand   &   Sons, New Delhi.
2. O. P. Gupta: Mathematical Statistics, Kedar nath Ram nath & Co.
3. P. N. Arora & S. Arora: Quantitative Aptitude Statistics – Vol II, S. Chand & Company Ltd.
4. K. Rohatgi & Ehsanes Saleh: An Introduction to Probability and Statistics, John Wiley & Sons.

IV.   Suggested Co-curricular Activities:
1. Training of students by related industrial experts
2. Assignments including technical assignments if any.
3. Seminars, Group Discussions, Quiz, Debates etc. on related topics.
4. Preparation of audio and videos on tools of diagrammatic and graphical representations.
5. Collection of material/figures/photos/author photoes of related topics.
6. Invited lectures and presentations of stalwarts to those topics.
7. Visits/field trips of firms, research organizations etc.

SEMESTER-II
COURSE 4: RANDOM VARIABLES AND MATHEMATICAL EXPECTATIONS

SEMESTER-VIII
COURSE 25 B: DATA MINING TECHNIQUES

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme- B.A./B.Sc. Statistics Honours -Question Paper model,
First Year-Semester-1
Course1 - Essentials and Applications of Mathematical, Physical and Chemical Sciences

Time: 3 Hours   Total Marks: 75

PART –A
Answer any Five of the following
Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions
5X5=25 Marks

1.

2.

3.

4.

5.

6.

7.

8.

9.

10

PART –B

Answer any Five of the following
Note: Draw labelled diagrams wherever necessary   5X10=50 Marks
Each unit must carry two questions

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme- B.A./B.Sc. Statistics Honours- Question Paper model,
First Year-Semester-1
Course 2 - Advances in Mathematical, Physical and Chemical Sciences

Time: 3 Hours   Total Marks: 75

PART –A
Answer any Five of the following
Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions
5X5=25 Marks

1.

2.

3.

4.

5.

6.

7.

8.

9.

10

PART –B
Answer any Five of the following
Note: Draw labelled diagrams wherever necessary   5X10=50 Marks

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.A. / B.Sc. Statistics Honours -Question Paper model,
First Year-Semester-2
Course 3 – Descriptive Statistics

Time: 3 Hours   Total Marks: 75

Section –A
Answer any Five of the following

5X5=25 Marks

1.

2.

3.

4.

5.

6.

7.

8.

9.

10

Section –B   **5x10=50 Marks**

Answer the following

11a.

Or

11b.

12a

Or

12b.

13a.

Or

13b

14a.

Or

14b.

15a.

Or

15b.

Time: 3 Hours   Total Marks: 75

Section –A
Answer any Five of the following

5X5=25 Marks

1.

2.

3.

4.

5.

6.

7.

8.

9.

10

Section –B   **5x10=50 Marks**

Answer the following

11a.

Or

11b.

12a

Or

12b.

13a.

Or

13b

14a.

Or

14b.

15a.

Or

15b.