B.Sc. INFORMATION TECHNOLOGY
Students Admitted From A.Y. 2019-2020& Onwards

SEMESTER – I

19UITDA101	DSE Allied 1: Mathematics and Statistics -I	04 hrs/wk	04 Credits

Objectives:

To enable the students to
- Interpolate mathematical and statistical skills and knowledge which will be beneficial to develop proficiency in analytical reasoning.
- Demonstrate skills of solving real world problems.
- Associate basic methods of mathematics and statistics in computing to design and analyse algorithms, computability theory and graphics.
- Identify a problem and examine different methods to its solutions and evaluate merits and demerits of each.
- Distinguish a logical argument from a fallacious one in mathematical reasoning as well as in everyday life

Unit – 1 Set Theory (10 hrs)
- Introduction
- Methods of Representation of a Set
- Different Types of Sets
- Operations on Sets & its Properties (Union of Sets, Intersection of Sets, Complement of Sets, Difference of Sets) (Without Proof)

Unit – 2 Matrix (10 hrs)
- Introduction
- Different Types of Matrices, Trace of Matrix, Transpose of Matrix
- Addition & Subtraction of Matrices
- Multiplication of Matrices
- Adjoint of a Matrix

Unit – 3 Number System (10 hrs)
- Types of Number System (Binary / Octal / Decimal / Hexadecimal)
- Conversions
    - Decimal to Binary / Octal / Hexadecimal
    - Binary to Decimal / Octal / Hexadecimal
    - Octal to Binary / Decimal / Hexadecimal
    - Hexadecimal to Binary / Octal / Decimal
- 1's Complement & 2's Complement
- Addition of two binary number
- Subtraction of two binary number using 1's complement & 2's complement

Unit – 4 Mathematical Logic   **(10 hrs)**

- Introduction
- Simple & Compound Propositions
- Connectives
- Truth Values & Truth Tables of a Proposition.

Unit – 5 Correlation & Regression   **(10 hrs)**

- Introduction
- Different Types of Correlation
- Correlation and Regression Coefficients and Their Properties
- Rank Correlation
- Regression Lines.

Text Books:

- *J. K. Sharma,* 2003, **Discrete Mathematics** [First Edition], Macmillan India Ltd., India.   (Unit 1, 4)
- *V. N. Vedamurthy and N Iyengar*, 1998,**Numerical Methods** [First Edition] Vikas Publishing House Pvt Ltd, India. (Unit 2)
- *Pradeep K*. Sinha and PritiSinha, 2007 **Computer Fundamentals**[Sixth Edition], BPB Publication, India(Unit 3)
- *S. C. Gupta and V. K. Kapoor*, 2001, **Fundamentals of Mathematical Statistics** [Tenth Edition, Revised] Sultan Chand & Sons, India. (Unit 5)

Reference Books:

- *Olympia Nicodemi,* 1987, Discrete Mathematics: A Bridge to Computer Science and Advanced Mathematics [First Edition], West Publishing Company, USA.
- *S. C. Gupta and V. K. Kapoor*, 2001, **Elements of Mathematical Statistics** [Third Edition, Revised], Sultan Chand & Sons, New Delhi.

19UITDA201	DSE Allied 2: Mathematics and Statistics –II	04 hrs/wk	04 Credits

Objectives:

To enable the students to

- Interpolate mathematical and statistical skills and knowledge which will be beneficial to develop proficiency in analytical reasoning.
- Demonstrate skills of solving real world problems.
- Associate basic methods of mathematics and statistics in computing to design and analyze algorithms, computability theory and graphics.
- Identify a problem and examine different methods to its solutions and evaluate merits and demerits of each.
- Distinguish a logical argument from a fallacious one in mathematical reasoning as well as in everyday life.

Unit - 1Co-Ordinate Geometry (10 hrs)
- Introduction
- Distance between Two Points in R_2 (without proof)
- Equations of Different Types of Line (without proof),
- Parallel Lines, Perpendicular Lines

Unit - 2 Interpolation (10 hrs)
- Introduction of Interpolation & Extrapolation
- Newton Forward Interpolation (without proof)
- Newton Backward Interpolation (without proof)
- Lagrange Interpolation (without proof).

Unit - 3 Progression (10 hrs)
- Introduction
- Arithmetic Progression, Harmonic Progression, Geometric Progression,
- n^{th} Term & Sum of First n Terms of A.P. & G.P. (without proof)
- Arithmetic Mean, Harmonic Mean, Geometric Mean.

Unit - 4 Transportation Problem (10 hrs)
- Introduction
- North – West Corner Method
- Least Cost Method
- Vogel's Approximation Method.

Unit - 5 Measure of Central Tendency & Dispersion (10 hrs)
- Introduction
- Mean

- Median
- Mode
- Quartiles
- Range

Text Books:
- *C. B. Boyer. 2004. **History of Analytic Geometry***[First Edition]. Dover Publications, USA. (Unit 1)
- *S. C. Gupta and V. K. Kapoor*. 2001. **Fundamentals of Mathematical Statistics.** [Tenth Edition, Revised]. Sultan Chand & Sons, New Delhi. (Unit 3, 5)
- *V. N. Vedamurthy and N Iyengar*. 1998.**Numerical Methods.** [First Edition] Vikas Publishing House Pvt Ltd, New Delhi.
- (Unit 2)
- *V. K. Kapoor.* 2014. **Operations Research – Concepts, Problems & Solutions** [Fifth Edition, Revised]. Sultan Chand & Sons, New Delhi. (Unit 4)

Reference Books:
- *S. C. Gupta and V. K. Kapoor*. 2001. **Elements of Mathematical Statistics.** [Third Edition, Revised]. Sultan Chand & Sons, New Delhi.
- *J. P. Tremblay and R. Manohar.* 2001. **Discrete Mathematical Structures with Applications to Computer Science** [First Edition]. Mcgraw Hill Education, New York.
- *V. K. Kapoor*. 2001. **Operations Research.** [Sixth Edition, Revised]. Sultan Chand & Sons, New Delhi.

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