Enclosure-IIIC

DSE Allied courses in Mathematics offered to B.Sc. –Bio-Chemistry by Department of Mathematics

Semester – IV			
19UBCDA401	**DSE Allied - 4 Mathematics for Biologists**	**4hrs/week**	**4Credits**

Objectives:-

Upon completion of the course students will be able to

1. Understand the Vann diagram of various set operation.
2. Find Integration and differentiation of some standard functions.
3. Find the probability of any event.
4. Understand and construct the probability distribution and find mean and variance of the given Binomial Distribution and Poisson Distribution
5. Produce and interpret numerical summary statistics using mean, median, mode, range, standard deviation and variance.
6. Understand the sampling methods &Perform and interpret testing of hypothesis including chi-squared test and t- test.
7. Understand and utilize the formulae of Logarithm, Permutation and Combination, Area and Volume

Unit 1:Set Theory, Differentiation and Integration (10 hrs)

- Basic definition of sets and its examples.
- Various operations on set.
- Vann Diagram.
- Applications of set theory.
- Differentiation of some standard functions
- Differentiation by rule
- Integration of some standard functions
- Definite integral
- Indefinite integral

Unit 2: Probability distributions (10 hrs)

- Concept of probability
- Laws of probability
- Normal distribution
- Binomial distribution

Unit 3: Measures of central tendency and dispersion (10 hrs)

- Characteristics of a good average
- Mean, median and mode
- Measures of dispersion-
- Range, mean deviation, standard deviation, variance

Unit 4: Logarithm, Permutation and Combination, Area and Volume (8 hrs)

- Logarithm.
- Solving problems using the properties of Logarithm.
- Permutation and Combination.
- Area of sphere, Cone, Cylinder.
- Volume of sphere, Cone, Cylinder.

Unit 5:Data Collection, Presentation and Hypothesis testing (10 hrs)

- Sampling methods
- Random and non-random sampling
- Graphical presentation of data
- Tests of hypothesis
- Types of hypothesis
- Tests of significance for small samples- student's t test, Chi-square test

TEXTBOOKS: -

1. Digambar Patri, D. N. Patri, Statistical Methods, Kalyani Publications.
2. Prof. H. K. Dass, Applied Mathematics, CBS Publishers & Distributors, New Delhi.
3. Robert R. Stoll, Set Theory and Logic, Eurasia Publishing House Pvt. Ltd.

REFERENCE BOOKS:-

1. Prof. H. R. Vyas, Business Statistics, B.S. Shah Prakashan.
2. Nabendu Pal, Sabaded Sarkar, Statistics concepts and Applications, Prentice Hall of India.
3. J. N Kapur, H. C Saxena, Mathematical Statistics, S. Chand & Company Ltd.
4. P.S.S. Sundar Rao, J.Richard, Introduction to Biostatistics and Research Method, PHI Learning Private Ltd.
5. R. S. Agarwal, Quantitative Aptitude, S. Chand and Company, New Delhi.

Semester – IV			
19UBCDA402	**DSE Allied Practical - 4: Mathematics for Biologists Practical**	**2 hrs/wk**	**1 Credits**

Objectives:-

Upon completion of the course students will be able to

1. Draw graphs of mathematical function.
2. Understand the Vann diagram of various set operation.
3. Find Integration and differentiation of some standard functions.
4. Find the probability of any event.
5. Produce and interpret numerical summary statistics using mean, median, mode, range, standard deviation and variance.
6. Calculate areas and volumes of geometric shapes including sphere, cone, cylinder.

List of Practical

1. Plotting of Graphs of Trigonometric, Exponential and Logarithmic function.
2. Problems based on Set theory and Vann diagram.
3. Problems based on Differentiation.
4. Problems based on Integration.
5. Problems based on probability, Normal distribution and Binomial distribution.
6. Problems based on mean, median, mode.
7. Problems based on variance and standard deviation.
8. Problems based on properties of Logarithm.
9. Problems based on Permutation and Combination.
10. Problems based on Area of sphere, cone, cylinder.
11. Problems based on volume of sphere, cone, cylinder.

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