II B.Sc (MB)	CLASSICAL GENETICS & BIO-STATISTICS	AZCMB301
SEMESTER - IV		HRS/WK - 6
ALLIED		CREDIT - 5

(For II Year B.Sc., Micro-Biology :IV Semester)

Unit – I : Genetics and Mendel's laws :

History of genetics – Mendel's experiments: monohybrid, dihybrid and polyhybrid cross - Mendel's laws of inheritance - hybrid vigour – gene expressivity - pleiotropism – incomplete dominance – complementary genes - epistasis - supplementary genes – duplicate genes – lethal genes – atavism – multiple genes – polygenic inheritance – continuous and discontinuous characters.

Multiple Alleles and linkage

Characters and theories of multiple alleles – sub alleles and iso alleles - ABO Blood Group inheritance - Rh factor – linkage and linkage group – history - linked genes – complete and incomplete linkage – significance of linkage.

Unit – II : Recombination in Eukaryotes :

Mechanism – stage specificity - cytological evidence – frequency of crossing over – factors controlling crossing over – mitotic and meiotic crossing over – somatic and germinal crossing over – significance of crossing over - construction of chromosome maps – history of chromosomes – size, shape, structure, types and physiology of chromosomes- gene concept - gene function.

Unit – III: Molecular,Human and and cytogenetics

DNA as the genetic material – nucleic acids – structure of DNA , gene – enzyme relationship - euploidy - aneuploidy – chromosomal aberarrations

Pedigree analysis – human chromosomes – eugenics and euphenics – inbreeding, outbreeding and hybrid vigour - population genetics.

BIO-STATISTICS

Unit – IV:

Introduction – Scope – Definition – Importance – Functions – Data – Data collection – Methods of data collection – Classification of Data – Tabulation of Data – Diagramatic, Graphical presentation of Data – Histogram – Frequency polygon – Oogive curves.

Measures of central tendency _ Arithmetic mean – Median – Mode

Measures of dispersion – range – quartile deviation – standard deviation and coefficient of variation – mean deviation – skewness – kurtosis.

Unit –V:

Correlation – simple correlation – Rank correlation – Regression – Probability – Addition theorem – Multiplication theorem – Permutation and combinations.

Test of significance – Hypothesis testing – Null hypothesis – alternative hypothesis – Large sample test – small sample test (Students 't' test) – chi-square test – standard error – ANOVA (Analysis of variance) – one way ANOVA.

Text Books:

1. Verma, P.S and Agarwal, V.K 2005 ' Cell Biology, Genetics, Molecular Biology, Evolution & Ecology', S. Chand and Co., New Delhi.
2. Biostatistics P. Ramakrishnan Saras Publications 1996 A.R.P. Camp Road, Kottar, Nagarkoil, Kanyakumari District.
3. Elements of Biostatistics by Gurumani Nithi Publishers.

Reference books:

1. Veer Bala Rastogi. 1992 .A textbook of Genetics, 9th edition, Keda Nath Ram Nath, New Delhi.
2. Karvita B. Aluwalia , 1991. 'Genetics' Wiley Eastern Ltd, New Delhi .
3. Sarin, C.1990. ' Genetics' Tata Mcgraw – Hill Publishing Co ., Ltd., New Delhi.
4. Burns. G.W .and Boltsmo, P.J. 1989. The Science of Genetics' Macmillan publishing Co ., New York.

QUESTION PATTERN

Written paper Max Marks: 75 Marks

Time :3 Hours

A Question paper consists of three parts

Part-A

10 very short answer question without choice .Equal representation to be given to both the papers. Each question is to be answered in about 50 words . Each answer is to be valued out of 2 marks.

Part-B

5 questions are to be answered out of 8 given . Equal representation to be given to both the papers .Each question is to be answered in about 300 words . Each answer is to be valued out of 5 marks.

Part-C

Essay questions containing internal choice to be answered in about 1200 words. Equal representation to be given to both the papers. Each answer is to be valued out of 15 marks.

Part-A

Very Short Answers(50 words) 10 questions each 2 marks.

Part-B

Short Answers(300 words) 5 questions each 5 marks.

Part-C

Essay questions (1200 words) 2 questions each 15 marks.