Teaching:

Genetics:

Aim 1: Introductory notes in brief.
Aim 2: Introductory review of principles of molecular genetics: DNA, the code, gene, gene structure, function and replication, the central dogma, genetic defects. Why gene is unique?

Aim 3: Reminder of some Mendelian genetics, qualitative and quantitative traits, linkage, pleiotropy, dominance relation, epistasis, additive gene action, genotype x environment interaction, lethal genes.

Aim 4: Population genetics: Gene and genotype frequency, systematic processes (migration, mutation, selection and mating system) and dispersive processes (sampling) that change gene frequency, random genetic drift. Hardy-Weinberg equilibrium, fixation, heterozygote superiority and polymorphism.

Aim 5: Genetic and environmental variation and their sources.

Aim 6: Quantitative genetics: Nature of genetic variation, number of loci, values and means, variance and partitioning into components, average gene effect and breeding values, degree of genetic determination, resemblance between relatives and heritability in broad and narrow sense.

Aim 7: Genetic bases of:
- Selection and response, selection differential and intensity, limit to selection and its nature.
- Inbreeding and crossbreeding, hybrid vigor.

Aim 8: The concept and results on:
- Genetic resistance to stress and disease.
- Genetic markers and selection.
- Transgenesis and transgenic animals as a biotechnology.

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Biostatistics:

Aim 1: Purpose of statistics:
-Collect samples and data
-Summarize and present data
-Analyze data
-Draw conclusions
-Design experiments

Aim 2: Sources of variation in nature, population and samples.

Aim 3: Frequency distributions (normal and binomial), central tendency and variability, measures of variance and precision, point and interval estimates.

Aim 4: Confidence interval and philosophy of tests of significance, the null hypothesis.

Aim 5: Tests of significance and statistical inference:
- T-test (quantitative and qualitative data)
- Chi-square and goodness of fit.
- Analyses of variance, the concept and the F-test, multiple comparison tests (LSD)
- Some non parametric tests.

Aim 6: Measures of association: correlations and regression.

Aim 7: Odds and ratio of the odds (relative risk)

Aim 8: Some facts and fallacies.

ALL TOPICS ASSOCIATED WITH EXAMPLES AND PRACICAL WORK.