Human Genetics
(Learning Objectives)

- Review the presence of homologous chromosomes in diploid organisms that reproduce sexually. Define the term “karyotype”. Which chromosomes are known as autosomes and which are known as sex chromosomes?
- Recognize Mendel’s contribution to genetics and the terminology he used. Understand and define: characteristic, trait, true-breeder, genotype, phenotype, allele, autosomal dominant and recessive traits, and a monohybrid cross.
- Learn what is meant by a test cross and when it is used.
- Review the Punnett square and learn how to use it for determining genotypes and phenotypes and probability of offspring for autosomal dominant or recessive traits.
- Learn how pedigrees are used to determine the pattern of inheritance and make genetic predictions.
- Explain how gender is determined in mammals. Define X- or Y-linked genes. How does the location of a gene on the X chromosome affect its gender-related transmission?
- Use a Punnett square to determine the probability of passing of an X-linked gene and the phenotype to girls or boys based on the genotypes of the parents.
- Explain X-inactivation and why it exists only in cells of females.
- Explain the pattern of inheritance of genes present on the mitochondrial DNA why?
- Review the factors affecting the phenotypes of Mendelian characters and provide examples for each: incomplete dominance, co-dominance & multiple allele, pleiotropy, polygenic inheritance, environmental effect.