**Genetics and Biotech Exam Review Guide**

**Introduction to Genetics**

* Define genetics
* Define trait
* Identify the Mendel's principle findings on the patterns of genetics (inheritance patterns)
  + What does it mean for a trait to be dominant or recessive?
  + What does the Law of Segregation state? How is this shown during meiosis?
  + What does the Law of Independent Assortment state? When does this occur during meiosis?
* Define genotype and phenotype
  + What is an allele?
  + How is genotype used to determine phenotype?
* Distinguish between a homozygous genotype and a heterozygous genotype
  + How is a homozygous dominant genotype different from a homozygous recessive genotype?

**Monohybrid & Dihybrid Crosses**

* Identify the purpose of a Punnett square
  + How is the Law of Segregation demonstrated while using a Punnett square?
  + How does this demonstrate the Law of Independent Assortment?
  + How is fertilization demonstrated while using a Punnett square?
  + Why is it important to realize that this is a PROBABILITY and not a certainty?
* Use a Punnett square to show the possible genotypes of the offspring in a monohybrid cross
* Calculate the genotypic and phenotypic ratio for a monohybrid cross
* Define monohybrid cross and dihybrid cross
* Determine the possible gametes from a parental genotype representing two traits
* Use a Punnett square to show the possible genotypes of the offspring in a dihybrid cross
* Calculate the genotypic and phenotypic ratio for a dihybrid cross

**Non Mendalian**

* Use a Punnett square to show the possible genotypes of the offspring in a incomplete dominant cross
* Calculate the genotypic and phenotypic ratio for a incomplete cross
* Use a Punnett square to show the possible genotypes of the offspring in a incomplete dominant cross
* Calculate the genotypic and phenotypic ratio for a co-dominant cross
* Define complete, incomplete and co dominant
* Define Multiple Alleles and Sex Linked
* Determine the possible gametes incomplete dominant, co dominant, sex linked and multiple allele genes
* Use a Punnett square to show the possible genotypes of the offspring in a sex linked cross, including the biological sex
* Calculate the genotypic and phenotypic ratio for a sex linked cross, including the biological sex
* Use a Punnett square to show the possible genotypes of the offspring in a multiple allele cross
* Calculate the genotypic and phenotypic ratio for a multiple allele cross