Practicals - (60 Hours)

- Verification of nodal voltage and mesh current methods for solving circuits.
- Verification of important network theorems.
- Study of the response of the first order R-C and R-L circuits.
- Study of the response of a series and a parallel RLC circuits.

Essential/recommended readings

- Linear circuits: analysis and synthesis - Ayyagari Ramakalyan, Oxford University Press, 2005,
- Linear circuit analysis - Chi Kong Tse, Addison-Wesley, 1998

GENERIC ELECTIVES (GE-5)
V. 4.3. Genes to Genomes

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
Genes to Genomes, GE-5, V.4.3.	4	2	0	2	12th Pass	NIL	Biology Faculty CIC

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Learning Objectives

This module is designed to:

- Introduce students to the basics of genetics and genome biology
- Introduce students to genome sequencing analysis.
- Introduce students to population genetics.

Learning outcomes

After studying this course, the students will be able to:

- Comprehend the basis of the inheritance of characters from simple to complex
- Understand and analyze population-based inheritance patterns
- Generate and analyze Pedigree charts and family trees for inherited diseases

Syllabus

Unit I: Discovery of the gene concept and beyond (8 Hours)

Mendelian and non-Mendelian inheritance, Gene interaction, Epistasis, Linkage pedigree and recombination

Unit II: Population genetics (7 Hours)

Hardy Weinberg Principle and equilibrium, deviations and role of evolution in the equilibrium, metabolic and other diseases

Unit III: Eukaryotic genome complexity (7 Hours)

Junk DNA, Characteristics, Genome mapping techniques, Genome evolution, Transposable elements, Coding and noncoding RNA,

Practicals - (60 Hours)

- Punnett square, T-test
- Analysis of gene mapping
- Pedigree analysis
- Calculations to understand genome evolution
- Mathematical equations and models for prediction of inheritance

Essential/recommended readings

1. *Biology*, Raven et al., Tata McGraw-Hill, 2013.
2. *Biology: Global Approach*. Reece et al., Pearson Educations, Global edition, 2014.