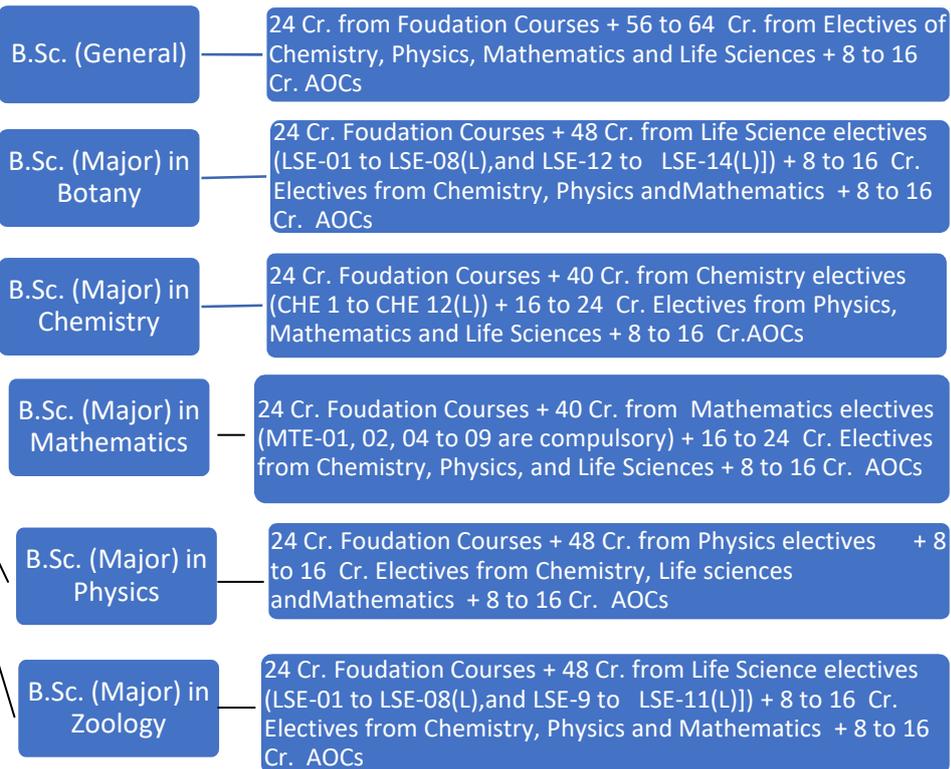


**Bachelor's Degree Programme in Science (B.Sc.)**

96 Credits



# Foundation Courses – 24 credits, compulsory

FST-1: Foundation Course in Science and Technology (8 Cr.)

- To understand the development of science and technology in the context of society in general, and the Indian situation in particular.
- To appreciate the method of science and apply it in solving problems that one may come across in life.
- To adopt a scientific outlook towards life, that is acquire a spirit of enquiry, objective thinking and rational approach in life.

Assessment  
TEE-70% CA-30%

BSHF-1: Foundation Course in Humanities and Social Sciences (8 Cr.)

- To familiarize the learners with basic notion of most of the social, economic, political, cultural and other related humanistic problems.
- To learn about the our unique struggle against colonialism, cultural renaissance, etc., and relate this with social transformation and national integration.
- To familiarize learners with the process of economic planning in India.

Assessment  
TEE-70% CA-30%

BHDF-101: Foundation Course in Hindi (4 Cr.)  
or  
FHD 02: Foundation Course in English (4 Cr.)  
or  
Foundation Course in any one of the Modern Indian Languages (4 Cr.) (Options of 14 courses)

- To improve the learner's proficiency in languages by developing the skills in reading, writing, listening and speaking.

Assessment  
TEE-70% CA-30%

# CHEMISTRY ELECTIVES

CHE-01: Atoms and Molecules

- To discuss the relationship of this course with other branches of chemistry .
- To explain the fundamental concept of atomic and molecular structure .
- To explain the importance pf physicial methods in identifying the structure of simple molecules.

Assessment  
TEE-70% CA-30%

CHE-02: Inorganic Chemistry

- To explainthe importance of inorganic chemistry.
- To describe the relationship of inorganic chemistry with other branches of chemistry.
- To discuss the periodic trend in the properties of elements and their compounds in terms of electronic structure.
- To describe the general methods of isolation and purification of metals and appreciate the importance of different elements and their compounds in living system.

Assessment  
TEE-70% CA-30%

CHE-03(L): Chemistry Lab-1

- To explain the basic concepts involved in titrimetric analysis.
- To explain the principles of acid-base, redox and complexometric titrations.
- To select and use appropriate apparatus/equipment for the titrimetric, potentiometric, conductometric and colorimetric analysis.

Assessment  
Guided Experiment-70%  
Unguided Experiment-30%

CHE-04: Physical Chemistry

- To deal with the following thre aspects of matter:  
Structure  
Equilibrium properties  
Ability to change

Assessment  
TEE-70% CA-30%

CHE-05: Organic Chemistry

- To discuss general methods of preparation of various organic compounds.
- To describe the properties, both physical and chemical for various classes of organic compounds.
- To relate the properties and reactivities of organic molecules with their structure .

Assessment  
TEE-70% CA-30%

CHE-06: Organic Reaction Mechanism

- To describe the basic concept of reaction mechanism.
- To explain the types of organic reactions and their mechanism.
- To describe pericyclic and photochemical reactions.
- To outline some important synthetic methods in organic chemistry.

Assessment  
TEE-70% CA-30%

CHE-07(L): Chemistry Lab- II

- To prepare and purify simple inorganic compounds.
- To perform gravimetric determinations of certain inorganic ions.
- To perform qualitative analysis of mixture of inorganic salys.
- To discus the principles involved in the preparation and analysis of inorganic compounds.

Assessment  
Guided Experiment-70%  
Unguided Experiment-30

CHE-08(L): Chemistry Lab- III

- To describe various criteria which have to be kept in mind while choosing particular procedure for the synthesis of a organic compound.
- To carry out experiments described for organic preparations.
- To identify fuctional groups and prepare their derivatives.
- To carry out experiments described for qualitative analysis of organic compounds.

Assessment  
Guided Experiment-70%  
Unguided Experiment-30

CHE-09: Biochemistry

- To identify the common chemical and structural features of the fundamental units of an oranism.
- To describe the biochemical significance of various biomoeclules.
- To explain the importance and mechanism of some common metabolic pathways and the energetic involve in the cell.
- To describe biosynthesis of some biomolecules along with the basic principles of immunology and biotechnology.

Assessment  
TEE-70% CA-30%

CHE-10 Spectroscopy

- To explin the basic concepts of atomic and molecular spctera.
- To use the idea of symmetry and group theory in explaining the vaious types of spectroscopy.
- To describe the theoretical features and application of various type of scpectroscopy.

Assessment  
TEE-70% CA-30%

CHE-11(L): Chemistry Lab- IV

- To explain the method of weighing a simple and preparing a standard solution.
- To carry out covers experiments related to the properties of liquids, thermochemistry, freezing point, EMF measurements, adsorption, phase equilibria and chemical kinetics

Assessment  
Guided Experiment-70%  
Unguided Experiment-30

CHE-12(L): Chemistry Lab- V

- To select and use appropriate separation techniues for the separation of organic and inorganic compounds.
- To carryout experiments describe for solvent extraction and chromatographic separation.
- To describe different methods for organic and inorganic quantiative analysis.
- To carryout preparation and analysis of compounds of daily use.

Assessment  
Guided Experiment-70%  
Unguided Experiment-30

MTE-03 Mathematical Methods

- To define and use mathematical objects like lines, planes, vectors etc.
- To integrate and differentiate simple function and solve simple differential equations
- To explain and use probabily distributions
- To use descriptive statistics an use simple tests for testing of hypothesis

Assessment  
TEE-70% CA-30%

# MATHEMATICS ELECTIVES

## MTE-01 Calculus

- To analyse the behaviour of basic mathematical functions (polynomial, rational, trigonometric, inverse trigonometric, exponential, etc) both graphically and analytically.
- To find the derivative of a function and apply differentiability in different real life situations.
- To evaluate integral of a function and apply it to find area, volume, arc length and surface area

Assessment  
TEE-70% CA-30%

## MTE-02 Linear Algebra

To define a vector space, linear independence, basis, and dimension  
To define homomorphism, kernel and rank of a homomorphism, state and apply the fundamental Theorem for homomorphism  
Define the characteristic equation, eigen values of a linear transformation and determine them

Assessment  
TEE-70% CA-30%

## MTE-03 Mathematical Methods

To define and use mathematical objects like lines, planes, vectors etc.  
To integrate and differentiate simple function and solve simple differential equations  
To explain and use probability distributions  
To use descriptive statistics and use simple tests for testing of hypothesis

Assessment  
TEE-70% CA-30%

## MTE-04 Elementary Algebra

To define basic concepts of set theory like sets, relations and functions and explain their properties  
To solve linear systems of equations using Gaussian Elimination and Cramer's rule.  
To use simple inequalities, explain the relation between the roots and coefficients of a polynomial and solve cubic and biquadratic equations

Assessment  
TEE-70% CA-30%

## MTE-05 Analytical Geometry

To understand analytically the concepts of conics and apply them to real life problems  
To generalise the concepts of conics to three-dimensional surfaces namely, paraboloid, ellipsoid and hyperboloid

Assessment  
TEE-70% CA-30%

## MTE-06 Abstract Algebra

Define a group, subgroup, order of a group, state and apply Lagrange's Theorem  
Define a normal subgroup, homomorphism, kernel of a homomorphism and quotient groups state and apply fundamental theorem for homomorphism between groups  
Define a ring, a subring, give examples, define a homomorphism between rings and state and apply the fundamental theorem for homomorphism between rings  
Define an integral domain, PID, Euclidean domain, Field, state their properties and give examples of them

Assessment  
TEE-70% CA-30%

## MTE-07 Advanced Calculus

Find limits, continuity and derivative of a function of more than one variable  
Find the jacobian of functions of more than one variable and use it to find the maxima and minima of functions of several variable  
Evaluate integrals of functions two and three variable

Assessment  
TEE-70% CA-30%

## MTE-08 Differential Equations

Explain some applications of differential equations arise in real life problems  
Define the order and degree of a differential equation  
Solve ordinary differential equations using methods like Charpits, variable separable  
Solve

Assessment  
TEE-70% CA-30%

## MTE-09 Real Analysis

To find whether a function is differentiable or not.  
To find limit using epsilon delta definition.  
To check whether a series is convergent or divergent.  
To check the uniform continuity of sequence and series.

Assessment  
TEE-70% CA-30%

## MTE-10 Numerical Analysis

To understand the importance of numerical techniques  
Apply them for solving different problems such as root finding, evaluation of integrals, and solving differential equations with initial or boundary conditions

Assessment  
TEE-70% CA-30%

## MTE-11 Probability and Statistics

To find the measure of central tendencies and dispersion and apply them in real life situations.  
To identify and apply theoretical distributions such as binomial, poisson, normal.  
To use chi-square, t-distribution, f-distribution, uniform distribution, etc.  
To find the Maximum likelihood, testing of hypothesis, etc.

Assessment  
TEE-70% CA-30%

## MTE-12 Linear Programming

To define the basic terms used in linear programming.  
To formulate and solve a LPP using graphical, and simplex method.  
To find the optimal solutions for the special LPPs such as transportation and assignment problems.  
To solve a game to find the pure and optimal strategies for each of the players of a two person zero sum game

Assessment  
TEE-70% CA-30%

## MTE-13 Discrete Mathematics

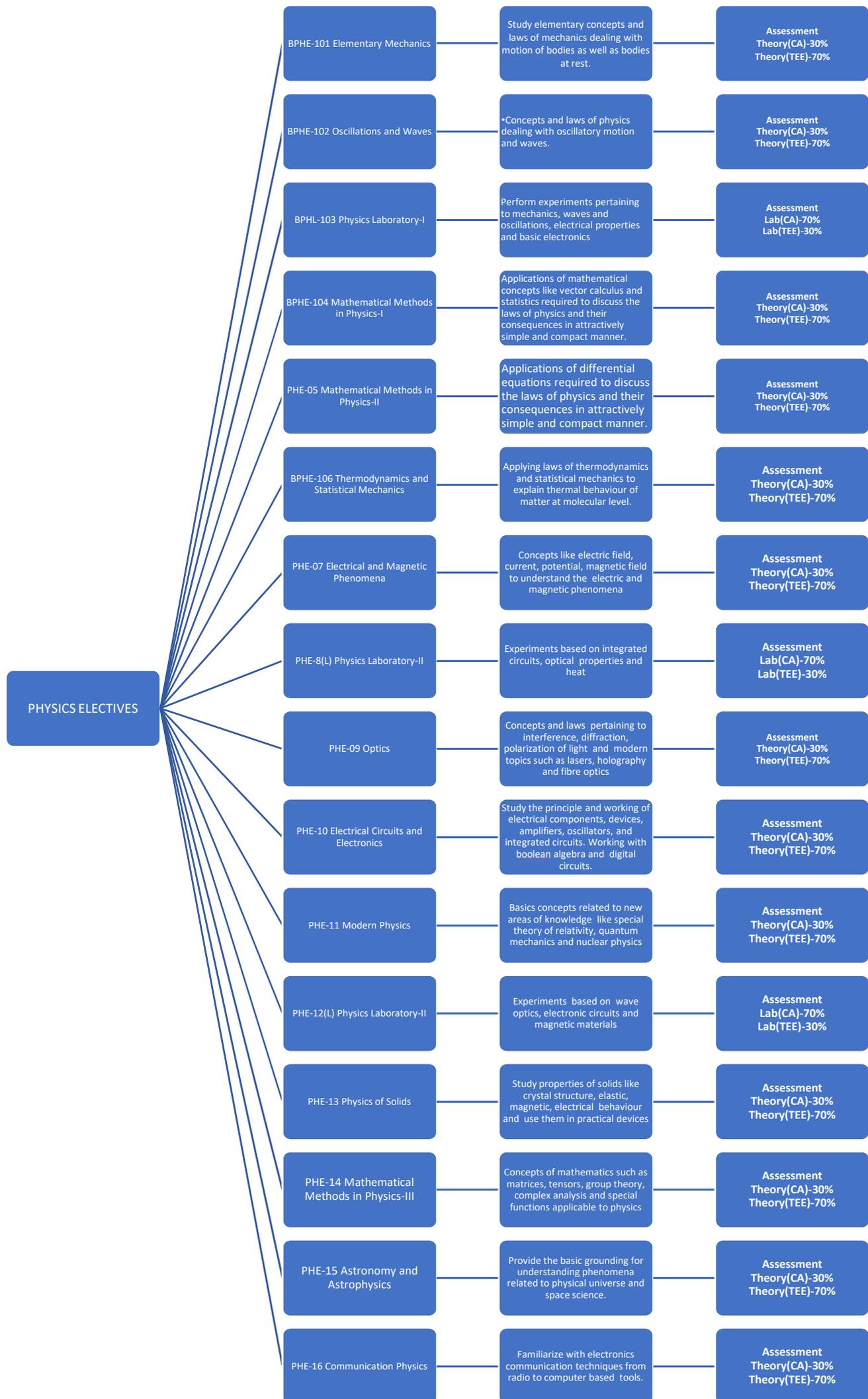
To present logic and arguments for proving or disproving statements  
To learn basic principles of combinatorics and apply them in real life situations  
To learn different methods of solving recurrence relations  
To learn how to model some real life problems through graphs, and understand some basic properties of graphs

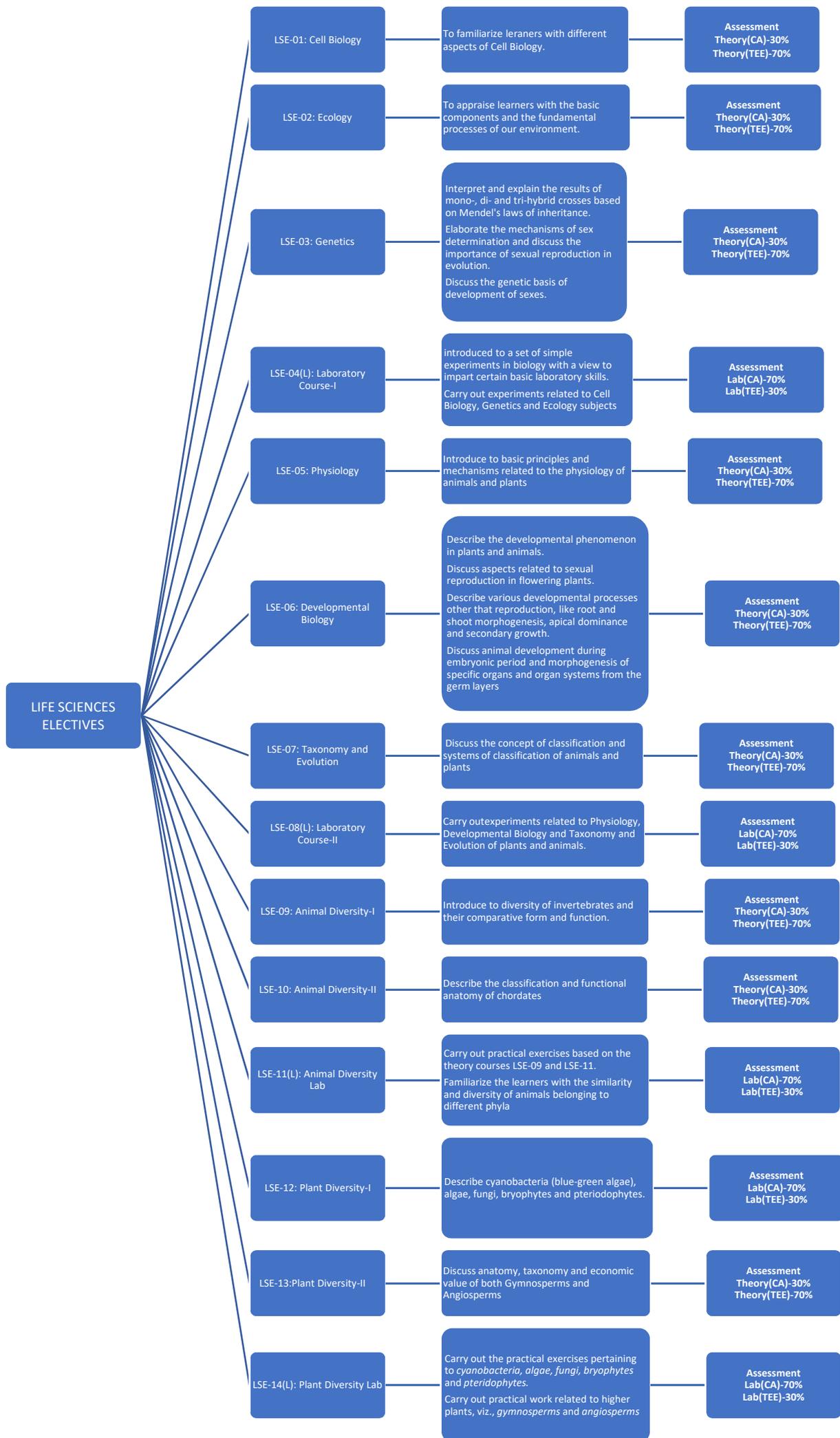
Assessment  
TEE-70% CA-30%

## MTE-14 Mathematical Modelling

To convert a word problem into its equivalent mathematical formulation  
To distinguish the essential characteristics of the problem from the non-essential ones  
To formulate the mathematical model of the real world situations which occur in many contexts of physical, biological, economic and social contexts  
To solve the formulated mathematical model

Assessment  
TEE-70% CA-30%





# AOCs Offered by the School of Sciences for BDP

