

GUJARAT TECHNOLOGICAL UNIVERSITY

BIOTECHNOLOGY (04)

INTRODUCTORY BIOLOGY

SUBJECT CODE: 2130401

B.E. 3rd Semester

Type of course: B.E. (Biotechnology)

Prerequisite: Basic Concepts of Biology

Rationale: It is basic subject for the students of Bio-technology. Biotechnology deals with the entire living organism and this subject provides overview of evolution of organisms and major processes occurring in these organisms.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
				PA	ALA	ESE	OEP			
3	0	0	3	70	20	10	0	0	0	100

Contents:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	The Living World : Biology as “The Science of Life”, Nature and Methods of Science , Biology in Ancient India, Contribution of Aristotle, Emergence of Contemporary Biology, Use and Misuse of Biology , Careers in Biology, Unified and Basics Characteristics of Organisms, Analyzing the Living Things, The Energy Transfer Devices of Life, Metabolism is the total of all chemical reactions, Homeostasis, Growth, Development and Reproduction, Adaptation, Death	6	25
2	Origin and Evolution of Life : Origin of Life, The Meaning of Evolution, Ideas of Evolution before Darwin, Evidence of Evolution, Theories of Evolution, Modern Views of Darwinism, The Genetic Basis of Adaptation, Speciation and Isolation, Concept of species	6	
3	Plant and Animal Organization : Morphology of flowering plants – root, stem, leaf, flower, inflorescence, fruit and seed, Dispersal of fruits and seeds, Defensive mechanisms in plants, Internal structure of flowering plants, plant tissue and tissue types, internal structure of monocot and dicot plant, secondary growth, basics characteristics of animal tissues, types of animal tissues – epithelial, connective, muscular and nervous tissues.	12	25
4	Plant Physiology :	12	25

	Plant-water relations – water potential, absorption and movement of water, transpiration, Plant nutrition – micronutrients and macronutrients, mechanism of absorption, nitrogen metabolism, Plant hormones, Photosynthesis – basics concepts, light reaction, dark reaction, C3-Cycle, C4-Cycle, factors affecting photosynthesis, Types and mechanism of respiration, respiratory quotient		
5	Animal Physiology : Foods and nutrients of animals, Modes of nutrition in animals, human digestive system, Hormonal control of digestion in human, Absorption and Assimilation of digested product in human, Nutritional deficiencies and disorders, Gaseous exchange in animals, respiration in human, respiratory disorders, Circulatory system in human, disorders related to human circulatory system, Movement and locomotion in animals, basics of human nervous system, basics of human endocrine system.	12	25

Reference Books:

1. Biology, Textbook for class XI, NCERT
2. Biology, Textbook for Class XII, NCERT

Course Outcome:

After learning the course the students should be able:

1. Students will be familiar with the diversity of the living world.
2. Students will understand the process of evolution of different living organisms.
3. Students will get acquaintance with the external and internal characteristics of plants and animals.
4. Students will get familiar with the organization, organ system functioning and physiological aspects of both plants and animals.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.