

SARDAR PATEL UNIVERSITY
B.Sc. SECOND SEMESTER
Core Course Biology
(US02CBIO21) (T) GENETICS, TISSUE CULTURE AND GENERAL BIOLOGY
4 Credits, 4 periods per week
Total Marks 100, Internal -30 Marks, External-70 Marks, exam duration: 3 hours
(Effect from June, 2018)

NO.	Description in detail	Weight age (%)
1	<p>Unit 1: Principles of Inheritance and Variation</p> <ul style="list-style-type: none"> ▪ Heredity and Variation ▪ Important terms used in inheritance studies ▪ Brief history of Mendel ▪ Mendel's Experiments-Monohybrid cross, Dihybrid cross, Test cross, backcross and reciprocal cross ▪ Mendel's laws of Inheritance-Law of dominance, Law of segregation, Law of Independent assortment ▪ Interaction of genes-(1) Inter-allelic interaction-(i) Incomplete dominance (1:2:1 ratio) ii- Co dominance (1:2:1ratio) (2) Inter-genic gene interaction-Epistasis-Dominant epistasis (12:3:1 ratio), Recessive epistasis(9:3:4 ratio), Supplementary genes,Complementary genes(9:7 ratio) ▪ Multiple allelism: characteristics, examples, Blood groups in man, types of blood groups-ABO, M-N), significance, Rh factor ▪ Sex determination (chromosomal mechanism) humans ▪ Environmental effect on sex determination ▪ Hormonal effect on sex determination ▪ Chromosomal variation – Euploidy (monoploidy and polyploidy) and Anuploidy (hypoploidy and hypoploidy) ▪ Genetic disorders (Brief account) – Haemophilia, Thalassemia, Albinism, Colour blindness 	25%
2	<p>Unit 2: Tissue Culture</p> <ul style="list-style-type: none"> ▪ Historical perspective ▪ Composition of media, Nutrient and hormone requirements (role of vitamins and hormones) ▪ Important terms: Totipotency, Nutrient medium, Explants, Callus, Organogenesis, Embryogenesis, Stem cells, Pluripotent, Micro propagation ▪ Basic requirement for Tissue culture laboratory ▪ Basic steps in tissue culturing (General process) ▪ Production of transgenic plants and transgenic animals and their significance Tissue culture applications 	25%
3	<p>Unit 3 : Plant morphology and taxonomy</p> <ul style="list-style-type: none"> ▪ Leaf Morphology - Parts of simple leaf ▪ Compound leaf and its types - Pinnate compound and Palmate compound ▪ Phyllotaxy and its types : Alternate, Opposite and Whorled ▪ Inflorescence : Racemose, Cymose, Special types 	25%

	<ul style="list-style-type: none"> ▪ Racemose - Raceme, Spike, Catkin, Spadix, Corymb, Umbel, Capitulum ▪ Cymose: Monochasial, Dichasial and Polychasial ▪ Special types: Verticillaster, Hypanthodium, Cyathium ▪ Solitary: Terminal and Axillary ▪ Flower : Four Whorls of Flower, Types of flower based on position of ovary ▪ Angiosperms : General Characters ▪ Outline classification of Bentham and Hooker's system ▪ General characters of Families : Malvaceae, Solanaceae, Cucurbitaceae ▪ Plant of economic importance of . ▪ Malvaceae : Jasud (<i>Hibiscus rosa-sinensis</i>), Bhoy Kanski(<i>Abutilon indicum</i>), Bhindi (<i>Abelmoschus esculentus</i>), Cotton(<i>Gossypium arboretum</i>) ▪ Solanaceae : Brinjal (<i>Solanum melongena</i>), Ashwagandha (<i>Withania somnifera</i>) Tobacco (<i>Nicotiana tabacum</i>), Chilli(<i>Capsicum annum</i>) ▪ Cucurbitaceae: Galka (<i>Luffa cylindrical</i>), Pumpkin(<i>Cucurbita maxima</i>) Kakdi (<i>Cucumis sativus</i>), Karela(<i>Momordica charantia</i>) 	
4	<ul style="list-style-type: none"> ▪ Unit 4 : General Account of Chordates: ▪ General characteristics and outline classification of Phylum Chordata ▪ Type of scales in fishes- Placoid, Cycloid, Ganoid and Ctenoid with examples ▪ Migration of Fishes with examples ▪ Parental care in fishes ▪ Parental care in amphibians ▪ Neoteny, Paedogenesis and economic importance of Amphibians ▪ Identification of poisonous and non-poisonous snakes ▪ Migration of Birds – types, causes and significance ▪ Flight adaptations in birds ▪ Type of feathers ▪ Origin and evolution of man 	25%

SUGGESTED READINGS:

NO	NAME OF THE BOOK
1	Cellbiology,Genetics,Molecular Biology,Evolution and Ecology-P.S.Verma and V.K.agarwal
2	College Botany Vol 1: Gangulee , Das and Dutta
3	Taxonomy of angiosperms: B. P. Pandey
4	A text book of Angiosperms-Singh,Pande and Jain
5	Atext book of botany-A.C.Dutta
6	Elements of Biotechnology-P.K.Gupta
7	GENETICS –P.K.GUPTA
8	Modern textbook of zoology (Vertebrates) – R. L. Kotpal
9	Bhojwani, S.S. and Razdan, M.K., - Plant Tissue Culture: Theory and Practice.
10	Cell Biology-P. S. Verma
11	Organic evolution-Veebala Rastogi