

GENETICS

NIZAM COLLEGE : DEPARTMENT OF GENETICS

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(Semester I)

Class : B.ScI year, 1st year

Section: Mb.G.C

Course/Paper: -1 Transmission Genetics

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Mendel's experiments- Choice of material, characters	2
Terminology and definitions – Mendel's factors, phenotypes, genotype, locus, allele, homozygotes, heterozygotes, purelines, filial generations, reciprocal cross, back cross, test cross	3
Law of Segregation- Monohybrid crosses with examples	2
Law of Independent Assortment – Dihybrid and Trihybrid crosses with examples.	2
Mendelian Inheritance in Man - Construction of pedigrees. Law of Independent Assortment – Dihybrid and Trihybrid crosses with examples	3
Determination of autosomal dominant (polydactyly), recessive (albinism), and X—linked (hemophilia) conditions from pedigrees.	3

Name of the Teacher: Sandhya.Jagtap

Head, Department of Genetics

Signature:

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester I)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: -1 Transmission Genetics

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Eukaryotic Cell cycle - Phases of cell cycle G ₀ , G ₁ , S, G ₂	2
Genes that determine the cell cycle – cyclins, CDK proteins, role of P ⁵³ in cell cycle.	3
Mitosis – Stages in mitotic cell division- significance of mitosis	3
Meiosis - Formation of Synaptonemal complex, crossing over, chiasma formation, significance of meiosis	3
Gametogenesis in Plants	2
Gametogenesis in Animals & Human	2

Name of the Teacher: Sandhya.Jagtap

Head, Department of Genetics
Signature:

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester I)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: Transmission Genetics -1

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Variations to Dominance - Penetrance and Expressivity; Co-dominance & Incomplete dominance	2
Pleiotropism.	2
Lethal and Sub-lethal Genes – Dominant and recessive Lethals	2
Modification of Mendel's Ratios - Different types of Epistasis with examples from different organisms	2
. Paramutation – mottling phenotypes in maize; Segregation distortion – Sd gene in <i>Drosophila</i>	2
Multiple alleles – theories of multiple allelic inheritance- Eye color in <i>Drosophila</i> , coat color in mice and rabbits.	2
ABO blood groups in man-inheritance, blood group incompatibility in transfusion, maternal fetal tolerance	2
Self incompatibility in plants	1

Name of the Teacher: Sandhya.Jagtap
Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester I)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: Transmission Genetics -1

Unit: 4

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Discovery of linkage & Phases of linkage	1
Chiasmata and crossing over.	2
. Cytological proof for crossing over and recombination	3
Recombination frequencies, Linkage analysis- 2-point, 3-point test crosses.	3
Recombination frequencies, Linkage analysis- 2-point, 3-point test crosses.	3
Gene mapping in <i>Neurospora</i> – Tetrad Analysis	2
Mitotic Recombination- <i>Aspergillus</i> .	1

Name of the Teacher: Sandhya.Jagtap
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: -2 GENETIC ANALYSIS

Unit:1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Complex loci – Rh blood group system in man, CDE alleles, maternal fetal incompatibility - Erythroblastosis Fetalis	3
Histocompatibility Loci – HLA system, organ transplantation.	2
Genes and Environment. Temperature effect - infra and ultra bar eye in Drosophila, coat color in rabbits.	3
Phenocopies – Microcephaly, Phocomelia and Amelia, Cleft lip and palate	2
Environment effects on Twins.	1
Features of Quantitative Inheritance- Additive effect; Kernel color and size in Maize, Skin color, height and IQ in man	3
Multifactorial inheritance – hypertension, diabetes mellitus	1

Name of the Teacher Sandhya.Jagtap:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: -2 GENETIC ANALYSIS

Unit:2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Chromosome morphology- size and shape; Euchromatin and Heterochromatin- constitutive and facultative heterochromatin.	3
Components of Chromatin, Histones & Non-histones.	2
Packing of DNA into Chromatin – Nucleosome and higher order organization	2
Specialized Chromosomes – Lampbrush chromosomes, Polytene Chromosomes, Super numerary chromosomes.	2
Chromosome Variation – Structural aberrations- Duplications, Deletions, Inversions & Translocations with examples, Genetic consequences	3
. Numerical aberrations – aneuploidy, euploidy autopolyploidy and allo- polyploidy with examples, Genetic consequences.	3

Name of the Teacher: Sandhya.Jagtap
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: -2 GENETIC ANALYSIS

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Primary and secondary sex determination	1
Mechanisms of sex determination in Insects, Birds, Melandrium, Human, Bonellia.	2
Sex-Linked inheritance – color blindness, Haemophilia, Duchenne Muscular Dystrophy, Vitamin D resistant rickets, body color in Drosophila	3
Sex chromatin & X-inactivation – inactivation center – dosage compensation – position effect variegation – gynandromorphs	3
Y-linked inheritance – Holandric genes – hypertrichosis pinnae, SRY gene	2
Partial sex linkage- Bobbed bristles in Drosophila, PAR region in man	2
Sex limited and sex- influenced characters with examples	2

Name of the Teacher: Sandhya.Jagtap

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)

Class : B.Sc, 1st year

Section: Mb.G.C

Course/Paper: -2 GENETIC ANALYSIS

Unit: 4

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Recombination and Gene mapping in Bacteria. a) Transformation. b) Conjugation. c) Transduction	3
Bacteriophage mutants	2
Recombination in Viruses	2
Chloroplast and Mitochondrial Inheritance	2
Maternal Inheritance – Laber’s Optic atrophy, shell coiling in snails	3
Extrachromosomal inheritance in Paramecium, Yeast, Drosophila	3

Name of the Teacher: Sandhya.Jagtap
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester III)
Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -3 GENE AND GENOME STRUCTURE, ORGANIZATION & EXPRESSION

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Structure of DNA – Primary, secondary and tertiary – Watson and Crick Model – Forms of DNA.	2
. Structure of RNA – m-RNA, t-RNA & r-RNA & other types such as sn RNA, micro RNA, interference RNA	3
DNA as Genetic material, transforming principle, Hershey and Chase experiment	2
RNA as Genetic Material	2
Replication of DNA-Semi conservative & Conservative methods, Meselson and Stahl's experiment	3
Mechanism of DNA replication-circular & linear	2
Enzymes involved in DNA replication.	1

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester III)
Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -3 GENE AND GENOME STRUCTURE, ORGANIZATION & EXPRESSION

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Nuclear genome organization, genes and gene numbers	2
Denaturation and renaturation.	2
Dissociation and re-association of DNA, reassociation kinetics of DNA – melting temperature (T_m values) and cot curves	3
Kinetic classes of DNA, single copy sequences, repeated sequences – moderately repetitive, highly repetitive – inverted, tandem and palindromic repeats	3
Satellite DNA.	2
Organisation of Eukaryotic gene- exons, introns, promoters and termination sequences.	3

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterIII)

Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -3 GENE AND GENOME SRUCTURE, ORGANIZATION & EXPRESSION

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Gene families and clusters egs., Histone genes and Globin genes	2
Mitochondrial and Choloplast genome organization, evolutionary significance	2
Compound eye locus in Drosophila – white eye and lozenge gene in Drosophila	3
One gene – one enzyme hypothesis egs. from Human and Neurospora	2
Analysis of rII locus	2
Co-linearity between gene and polypeptide, tryptophan synthetase	2
Intra codon recombination	2

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterIII)

Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -3 GENE AND GENOME SRUCTURE, ORGANIZATION & EXPRESSION

Unit: 4

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Transcription- template of transcription - sense and antisense strands	2
Formation of RNA transcripts: m-RNA, m-RNA splicing in eukaryotes.	3
Reverse transcription	2
Translation- initiation, elongation and termination	3
Genetic code	2
Polypeptide synthesis – distinguishing features between prokaryotes and eukaryotes during peptide synthesis.	3

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterIV)

Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -4 MOLECULAR GENETICS

Unit:1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Gene regulation in Bacteria- positive and negative regulation, inducible and repressible regulation.	3
Lac operon & Tryptophan operon	3
Lytic cascade in phage	2
Gene regulation in Eukaryotes – transcriptional regulation, enhancers, transcriptional motifs	3
Gal locus regulation in Yeast	2
Regulation of mating types in yeast	2

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterIV)
Class : B.Sc, 2rd year Section: Mb.G.C

Course/Paper: -4 MOLECULAR GENETICS

Unit:2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Differential expression of hemoglobin genes	2
Gene expression in development, pattern formation in Drosophila	4
Host Restriction & modification, Restriction enzymes- Type I, II & III	3
Vectors used for gene transfer- plasmids, cosmids and lambda phage, & other vectors	2
Cloning strategies-steps in Gene Cloning	2
Genomic & cDNA libraries	2

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterIV)
Class : B.Sc, 2rd year Section: Mb.G.C

Course/Paper: -4 MOLECULAR GENETICS

Unit:3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Spontaneous and induced mutations	2
Chemical and physical mutagens – alkylating agents, base analogs, UV and gamma rays	3
Mutations at molecular level. a) Transitions and transversions. b) Deletions and additions- Frame shift mutations	3
Detecting mutations in prokaryotes- Auxotrophic mutations, Ames test	2
Detection of mutations in Eukaryotes- Russel's test and DLTS in mice.	2
SLRL tests in Drosophila-CLB test & Attached X test	2

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterIV)

Class : B.Sc, 2rd year

Section: Mb.G.C

Course/Paper: -4 MOLECULAR GENETICS

Unit:4

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
DNA damage and repair mechanisms Photo-reactivation, excision repair, SOS repair, recombinational repair and error prone repair.	4
Transposable elements–structure and function	3
Bacteria- IS elements, Transposons and plasmids	2
Maize- Ac, Ds and Spm system	2
Drosophila – P-element and hybrid dysgenesis	2
Yeast- Ty element	2

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc

Section: Mb.G.C

Course/Paper: -5 POPULATION GENETICS

Unit: 1

No. of Hours Allotted: 20

Topics to be covered	No. of Hours
The concept of populations, Demes and Mendelian population	3
Attributes of a population	2
Random mating populations	2
Calculation of Gene & genotype frequencies in a population	3
Genetic equilibrium- Hardy Weinberg Law- Establishment of equilibrium for diallelic locus	4
Calculation of Gene frequencies in case of complete dominance	3
Application of HWL in case of multiple allelic loci, X-linked loci, multiple loci	3

Name of the Teacher: B.R.K.M.urthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -5 POPULATION GENETICS

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Evolutionary processes – Mutation- Mutation pressure	1
Irreversible mutation	1
Reversible mutation- Attainment of Hardy Weinberg equilibrium under mutation	2
Introduction to selection- Concept of Fitness, selection co-efficient, calculation of fitness based on survival and fertility.	2
Complete elimination of recessive genes	1
Selection against dominants	1
Selection favoring heterozygotes – stable equilibrium, balanced polymorphisms eg. sickle cell hemoglobin trait	2
Selection against heterozygotes – unstable equilibrium – Rh incompatibility	2
Joint effects of mutation and selection	1
Selection at the phenotypic level – directional, stabilizing and disruptive selection.	2

Name of the Teacher:

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -5 POPULATION GENETICS

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Polymorphism – mechanisms for maintenance of polymorphism	3
Migration: Effect on gene frequencies	3
Genetic Drift: Effective population size	3
Effect of drift on gene frequencies	2
Founder effect	2
Bottle neck effect	2

Name of the Teacher:

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -6-E1 GENOME ANALYSIS AND GENETIC ENGINEERING

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Centrifugation- Sucrose gradient and Cesium chloride gradient centrifugation	3
Chromatography – Principles and applications – Separation of peptides and amino acids	3
Gel electrophoresis – Principles and applications	2
Paper, agar, starch, PAGE electrophoresis - Isoelectric focusing, pulse field gel and submarine electrophoresis – separation of proteins and nucleic acids	3
Polymerase chain reaction (PCR) and its applications	2
Autoradiography – Principles and Applications	2

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -6-E1 GENOME ANALYSIS AND GENETIC ENGINEERING

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Hybridization techniques – Southern, Northern, Western blotting techniques – FISH, Principles and Applications. DNA - Microarray technology.	2
DNA sequencing – Maxam Gilbert’s method, Sanger’s method and automated sequencing, Next Generation Sequencing	2
Hybridoma technology and production of Monoclonal Antibodies	2
Chromosome Banding - G-banding, C-banding, R-banding, Q-banding, NOR banding	2
DNA Fingerprinting – RAPD technique, VNTRs	2
Physical methods – Electroporation – Microprojectile bombardment	2
Chemical methods – Liposome fusion, Calcium precipitation of DNA	1
Gene transfer mediated by vectors – R vectors, Ti vectors	1
Viral vectors	1

Name of the Teacher: B.R.K.Murthy

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -6-E1 GENOME ANALYSIS AND GENETIC ENGINEERING

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Transgenic plants – Need for developing transgenic plants	4
Development of insect and herbicide resistant plants	3
Development of stress tolerant plants	3
Transgenic animals – Need for developing transgenic animals	3
Nuclear transfer and cloning	3
Developing transgenic animals – Cattle, Birds, Fish and Mice – animal models for genetic diseases	4

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(Semester V)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -6-E2 MEDICAL GENETIS

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Introduction to Immunity –active and passive, Humoral and cell-mediated, components of the human immune system	2
Antigens and antibodies	1
Types and structure of Immunoglobulins- functions	2
Assembly of Immunoglobulin genes- Somatic Recombination- Antibody	2
Auto immune disorders	2
Major histocompatibility complex –Organ transplantation	2
Blood groups in human A B O ,MN, Rh, S/S and secretor antigens	2
Disorders of blood	2

Name of the Teacher:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterV)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -6 -E-2 MEDICAL GENETIS

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Cell cycle regulating proteins and genes	3
Hereditary cancers-Tumor Suppressor genes- p ⁵³ and p ^{RB} group of proteins, Retinoblastoma, Hereditary polyposis coli	3
Properties of cancer cells	2
Stages of cancer development	3
Proto oncogenes - mechanisms that convert them to oncogenes	2
Emerging trends in cancer therapy	2

Name of the Teacher:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (SemesterV)

Class : B.Sc

Section: Mb.G.C

Course/Paper: -6-E2- MEDICAL GENETIS

Unit:3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Some common syndromes	2
Sex chromosome anomalies	2
Origin of Barr body	2
Abberant sexual development-true and Pseudo Hermophrodites	2
Abortions and chromosomal anomalies.	2
Autosomal anomalies - Down's syndrome,Edward & Patau syndromes	3
Sex-chromosomal anomalies -Turners syndrome. Kline felter syndrome	3
Single gene disorders of autosomes and sex-chromosomes	2
Metabolic disorder – P K U ,albinism, alkaptonuria	2

Name of the Teacher:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester VI)
Class : B.Sc, 3rd year Section: Mb.G.C

Course/Paper: -7 BREEDING AND GENOME EVOLUTION

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Assortative mating	2
Construction of pedigrees – raw and forked pedigrees	2
Estimation of inbreeding coefficient using pedigrees	3
Effect of inbreeding - Effect of inbreeding on genotypic frequencies and inbreeding depression	3
Genetic load – mutational and segregational load	3
Inbreeding in small populations / isolates	2

Name of the Teacher:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -7 BREEDING AND GENOME EVOLUTION

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Self pollinated crops- mass selection, pure line, back cross, line breeding(pedigree method)	2
Cross pollinated crops-mass selection, progeny selection	2
Hybrids-steps in the production of hybrid varieties	2
Heterosis – genetic basis of heterosis, inbreeding depression & physiological basis of Heterosis	2
Cross breeding –objectives and types of hybridisation	2
Full sib mating	1
Parent - offspring and repeated back crosses	2
Line Breeding	1
Cross breeding and out crossing	1

Name of the Teacher:

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc , 3rd year

Section: Mb.G.C

Course/Paper: -7 BREEDING AND GENOME EVOLUTION

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
The origins of genomes	2
Acquisition of new genes by gene duplication and from other species	3
Non-coding DNA, transposable elements and genome evolution – origin of introns	3
Molecular Phylogenetics – UPGMA & NEIS index	2
Origin of Molecular Phylogenetics – Molecular clocks	2
Applications of Molecular Phylogenetics and establishment of evolutionary relationships	3

Name of the Teacher:
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -8-E-1 HUMAN GENETICS AND BIostatISTICS

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Types of Genetic disorders	1
Prevention of Genetic diseases - Identification of carriers	1
Risk prediction – for single gene disorders and multifactorial disorders	1
Genetic counseling – steps in counselling	1
Prenatal diagnosis – indications for prenatal diagnosis – Methods used in prenatal diagnosis	2
Management of inherited human diseases - Treatment of Genetic diseases	1
Gene therapy and its need -Strategies of gene therapy – somatic and germinal gene therapy	2
Ex-vivo and in-vivo gene therapy, advantages and disadvantages	2
Gene therapy trials – ADA deficiency, Cystic fibrosis, Hypercholesterolemia and cancers; vectors used in gene therapy- advantages and disadvantages	2
Gene therapy and ethical issues	1
Over view of Genome projects	1

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -8-E-1 HUMAN GENETICS AND BIOSTATISTICS

Unit:2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Humulin and Vaccines	3
Commercial enzymes – Subtilisin, Phytase	2
Introduction to Bioreactors	2
Bio-fertilizers and Biopesticides	3
Bioremediation	2
Biodegradation of Petroleum and Xenobiotics	3

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(Semester VI)
Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -8-E-1 HUMAN GENETICS AND BIOSTATISTICS

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Theory of probability – use of probability in testing segregation of genes	3
Concept of a random variable	3
Probability distributions – Binomial & Poisson's for discrete Genetic variable	2
Normal distribution– for continuous Genetic variables	2
Simple random sampling, test of hypothesis – Normal deviate test, t-test and Chi-square test in Genetic analysis	3
Correlation and Regression of genetic variables	2

Name of the Teacher: Sandhya.Jagtap
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -8-E-2 Plant Genetics and Biotechnology

Unit: 1

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Overview of genetics of biosynthetic pathways in plants	3
Anthocyanin biosynthesis in maize	2
Chlorophyll biosynthesis in maize	2
Starch biosynthesis in cereals	2
Genetics of Nitrogen fixation in plants- nif genes in Rhizobium	3
Genetic regulation of Nitrogen fixation	3

Name of the Teacher: B.R.K.Murthy
Signature:

Head, Department of Genetics
Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc, 3rd year

Section: Mb.G.C

Course/Paper: -8-E2 Plant Genetics and Biotechnology

Unit: 2

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Applications and importance of plant tissue culture	3
Media for tissue – MS medium- organic and inorganic constituents	3
Sterilization of media- steam, dry and filter sterilization, explants sterilization	3
Callus culture	2
Organogenesis and regeneration	2
Meristem culture and virus free plants	2

Name of the Teacher: B.R.K.Murthy

Signature:

Head, Department of Genetics

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019(SemesterVI)

Class : B.Sc-3rd year

Section: Mb.G.C

Course/Paper: -8-E-2 Plant Genetics and Biotechnology

Unit: 3

No. of Hours Allotted: 15

Topics to be covered	No. of Hours
Anther and pollen cultures- principle and protocol and its significance	3
Somaclonal variation- selection of clones and applications	3
Somatic embryogenesis- principle and applications	3
Artificial seeds- production and applications	2
Production of secondary metabolites of commercial value	2
Cryopreservation of plant cultures	2

Name of the Teacher: B.R.K.Murthy
Signature

Head, Department of Genetics
Signature