

Post Graduate Government College for Girls, Sector-42, Chandigarh
Teaching Plan for Bachelors (Third and Fifth Semester) and Post Graduate (Third Semester) Session (2020-2021)

Class: BTH 3RD SEM(2Yr)
Subject: GENTICS

Name of the Teacher: DR SMITA
Paper: THEORY

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	introduction
Week 2	10/08/2020 – 14/08/2020	introduction
Week 3	17/08/2020 – 22/08/2020	Mendelian laws of inheritance, Sex determination in drosophila, plants and animals
Week 4	24/08/2020 – 29/08/2020	Non-disjunction as a proof of chromosomal theory of inheritance
Week 5	31/08/2020- 05/09/2020	Numerical chromosome aberration polyploidy, aneuploidy, Chromosomal aberrations: duplications, inversions, translocations,
Week 6	07/09/2020- 12/09/2020	Chromosomal aberrations: duplications, inversions, translocations,
Week 7	14/09/2020- 19/09/2020	Position effects.
Week 8	21/09/2020- 26/09/2020	Gene interactions,
Week 9	28/09/2020- 03/10/2020	sex linked inheritance. Crossing over: molecular mechanism and cytological proof, Recombination, linkage,
Week 10	05/10/2020- 10/10/2020	gene mapping, Three point testcross, interference, coincidence, recombination frequencies,
Week 11	12/10/2020- 16/10/2020	Tetrad analysis, somatic cell hybridization for gene linkage studies, Hereditary defects.
Week 12	19/10/2020- 24/10/2020	Mutation: Spontaneous versus induced mutations, types of mutations, mutagenic agents: Physical, chemical and radiation
Week 13	27/10/2020- 30/10/2020	Molecular mechanisms of DNA repair, mutations frequency, correlation between mutagenicity and carcinogenicity,
Week 14	03/11/2020- 07/11/2020	Population genetics: Hardy-Weinberg equilibrium, gene and genotypic frequencies, Chisquare test, probability, pedigree analysis.
Week 15	09/11/2020- 12/11/2020	Basic microbial genetics: Conjugation, transduction, transformation,
Week 16	16/11/2020- 21/11/2020	isolation of auxotrophs, replica plating techniques, analysis of mutations in biochemical pathway, one gene – one enzyme hypothesis.
Week 17	23/11/2020- 28/11/2020	Extra chromosomal inheritance: mitochondrial and chloroplast genetic systems.

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Class: BTH 5th SEM(3rd Yr)

Name of the Teacher: DR SMITA

Subject: MOLECULAR BIOLOGY

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	Introduction
Week 2	10/08/2020 – 14/08/2020	Evidence & experiments DNA as genetic material
Week 3	17/08/2020 – 22/08/2020	DNA: Chemical composition of DNA DNA structure- single stranded DNA, detailed account of double stranded DNA, BDNA, Z.DNA and other structural forms and their importance
Week 4	24/08/2020 – 29/08/2020	Genome organization in prokaryotes: Molecular nature of the genetic material, Composition and structure of prokaryotic DNA and RNA.
Week 5	31/08/2020- 05/09/2020	Genome organization in eukaryotes: Composition and structure of eukaryotic DNA and RNA.
Week 6	07/09/2020- 12/09/2020	Composition and structure of eukaryotic DNA and RNA. Characteristic features of highly repetitive DNA, Tandem repetitive DNA and Mini and microsatellite DNA
Week 7	14/09/2020- 19/09/2020	Insertion sequences, Overview of central dogma
Week 8	21/09/2020- 26/09/2020	DNA replication: Prokaryotic DNA replication; replication origin and site and structure and DNA Ter regions
Week 9	28/09/2020- 03/10/2020	structure. DNA polymerases, composition and features, replication factors and the mechanism of replication, leading strand and lagging strand synthesis, processivity and fidelity.
Week 10	05/10/2020- 10/10/2020	Replication of single stranded DNA, M13 viral DNA.
Week 11	12/10/2020- 16/10/2020	Eukaryotic DNA replication; origins, replication initiation complexes and their assembly, licensing factors, DNA polymerases and their composition,
Week 12	19/10/2020- 24/10/2020	telomerase and mode of action, replication factors, disassembly of chromatin components and reassembly during replication.
Week 13	27/10/2020- 30/10/2020	RNAs: types, rRNAs; Structural features of rRNAs- prokaryotic and eukaryotic. tRNAs: structural features, their anticodon
Week 14	03/11/2020- 07/11/2020	Transcription: regulatory elements and mechanism of transcription regulation in prokaryotes and eukaryotes

Week 15	09/11/2020- 12/11/2020	Transcription: regulatory elements and mechanism of transcription regulation in prokaryotes and eukaryotes
Week 16	16/11/2020- 21/11/2020	Translation: Overview and mechanism of translation process in prokaryotes, characteristics of the genetic code, structure and charging of tRNA,
Week 17	23/11/2020- 28/11/2020	Gene Regulation: Regulation of gene expression in response to environmental conditions. Operon concept- the Lactose and the Tryptophan operon.

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Teaching Plan for Bachelors (Third and Fifth Semester) and Post Graduate (Third Semester) Session (2020-2021)

Class: BSc Biotech (E) 3rd SEM(2nd Yr) Name of the Teacher: Dr Smita
Subject: Biotechnology Paper: INTRODUCTION TO GENETIC ENGG
&IMMUNOTECHNOLOGY

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	Introduction,
Week 2	10/08/2020 – 14/08/2020	History and scope of rdna
Week 3	17/08/2020 – 22/08/2020	.Gene cloning , why need to clone,dna modifying enzymes: endo/ exo nuclease,
Week 4	24/08/2020 – 29/08/2020	Restriction enzymes
Week 5	31/08/2020- 05/09/2020	Ligase , phosphorylase,kinase, alkaline phosphatase, topoisomerase
Week 6	07/09/2020- 12/09/2020	Ligase , phosphorylase,kinase, alkaline phosphatase, topoisomerase
Week 7	14/09/2020- 19/09/2020	Isolation of DNA from animal plants and bacteria
Week 8	21/09/2020- 26/09/2020	Isolation of plasmid
Week 9	28/09/2020- 03/10/2020	Vectors / Host system ,E.coli plasmid vectors
Week 10	05/10/2020- 10/10/2020	E.coli plasmid vectors
Week 11	12/10/2020- 16/10/2020	Cosmid, BAC
Week 12	19/10/2020- 24/10/2020	Yeast vectors,
Week 13	27/10/2020- 30/10/2020	Yeast vectors
Week 14	03/11/2020- 07/11/2020	Genomic DNA library & cDNA library,
Week 15	09/11/2020- 12/11/2020	Transformation and transfection electroporation
Week 16	16/11/2020- 21/11/2020	Selection of recombinants / clone from libraray
Week 17	23/11/2020- 28/11/2020	PCR and applications

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Teaching Plan for Bachelors (First Semester) Session (2020-2021)

Class: BTH 1 SEM

Name of the Teacher: Dr. Smita

Subject: Introduction to biotechnology

S. No	Dates	Topics to be Covered
Week 1	01/09/2020-05/09/2020	introduction
Week 2	07/09/2020-12/09/2020	Introduction
Week 3	14/09/2020-19/09/2020	Biomolecules in a cell :DNA
Week 4	21/09/2020-26/09/2020	Biomolecules in a cell :DNA
Week 5	28/09/2020-03/10/2020	Biomolecules in a cell : RNA
Week 6	05/10/2020-10/10/2020	Fundamentals of recombinant DNA technology: Restriction Enzymes, Type II Restriction endonucleases,
Week 7	12/10/2020-16/10/2020	Vectors based on E.coli plasmids and their properties: pBR322, pBR327, pUC8.
Week 8	19/10/2020-24/10/2020	Vectors based on E.coli plasmids and their properties: pBR322, pBR327, pUC8.
Week 9	27/10/2020-30/10/2020	Introduction to concept of genomics, transcriptomics, proteomics and metabolomics
Week 10	03/11/2020 – 07/11/2020	Introduction to concept of genomics, transcriptomics, proteomics and metabolomics
Week 11	09/11/2020 – 12/11/2020	Introduction to concept of genomics, transcriptomics, proteomics and metabolomics
Week 12	16/11/2020 – 21/11/2020	Introduction to concept of genomics, transcriptomics, proteomics and metabolomics
Week 13	23/11/2020 – 28/11/2020	Bacteria as workhorses of biotechnology; E. coli as the model bacterium
Week 14	01/12/2020 – 05/12/2020	Saccharomyces cerevisiae and Neurospora in Biotechnology
Week 15	07/12/2020 – 12/12/2020	Introduction to multicellular organisms as research models: Drosophila melanogaster, Caenorhabditis elegans, Musmusculus. Daniorerio,
Week 16	14/12/2020 – 18/12/2020	Arabidopsis thaliana as model for plant genetics
Week 17	21/12/2020 – 26/12/2020	Role of viruses and bacteriophages in biotechnology