**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (UG 1st Year)**

**Session (2021-2022)**

**Class: BTH 1st SEM (HONS)**   **Name of the Teacher: DR. SMITA**

**Subject: Intro. To Biotechnology Period :1(Fri), 2(Wed)**

**Paper : Theory Room No : 111**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 1-09-2021 to 04-09-2019 |  |
| Week 2 | 06-09-2021 to 11-09-2021 |  |
| Week 3 | 13-09-2021 to 18-09-2021 | Introduction |
| Week 4 | 20-09-2021 to 25-09-2021 | Introduction |
| Week 5 | 27-09-2021 to 01-10-2021 | Biomolecules in a cell :DNA |
| Week 6 | 04-10-2021 to 09-10-2021 | Biomolecules in a cell :RNA |
| Week 7 | 11-10-2021 to 16-10-2021 | Fundamentals of recombinant DNA technology: Restriction Enzymes, Type II Restriction endonucleases, |
| Week 8 | 18-10-2021 to 19-10-2021 | Vectors based on E.coli plasmids and their properties: pBR322, pBR327, pUC8. |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 9 | 01-11-2021 to 06-11-2021 | Introduction to concept of genomics, transcriptomics, proteomics and metabolomics |
| Week 10 | 08-11-2021 to 13-11-2021 | Introduction to concept of genomics, transcriptomics, proteomics and metabolomics |
| Week 11 | 15-11-2021 to 20-11-2021 | Bacteria as workhorses of biotechnology; E. coli as the model bacterium |
| Week 12 | 22-11-2021 to 27-11-2021 | Saccharomyces cerevisiae and Neurospora in Biotechnology |
| Week 13 | 29-11-2021 to 04-12-2021 | Introduction to multicellular organisms as research models: Drosophila melanogaster, Caenorhabditis  elegans, Daniorerio, Musmusculus. |
| Week 14 | 06-12-2021 to 11-12-2021 | Arabidopsis thaliana as model for plant genetics |
| Week 15 | 13-12-2021 to 16-12-2021 | Role of viruses and bacteriophages in biotechnology |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2021-2022)**

**Class: BTH 3RD SEM (HONS) Name of the Teacher: DR SMITA**

**Subject: GENETICS Period :6 (MON – WED, FRI, SAT) 4(THURS)**

**Paper : THEORY Room No : 127**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | Introduction |
| Week 2 | 16-08-2021 to 21-08-2021 | Introduction |
| Week 3 | 23-08-2021 to 28-08-2021 | Mendelian laws of inheritance, Sex determination in drosophila, plants and animals |
| Week 4 | 31-08-2021 to 04-09-2019 | Non-disjunction as a proof of chromosomal theory of inheritance |
| Week 5 | 06-09-2021 to 11-09-2021 | Numerical chromosome aberration polyploidy, aneuploidy |
| Week 6 | 13-09-2021 to 18-09-2021 | Chromosomal aberrations duplications, inversions,: translocations, transversion, Position effects |
| Week 7 | 20-09-2021 to 25-09-2021 | Gene interactions, |
| Week 8 | 27-09-2021 to 01-10-2021 | Sex linked inheritance. Crossing over: molecular mechanism and cytological proof |
| Week 9 | 04-10-2021 to 09-10-2021 | , Recombination, linkage |
| Week 10 | 11-10-2021 to 16-10-2021 | gene mapping, Three point testcross, interference, coincidence, recombination frequencies, |
| Week 11 | 18-10-2021 to 19-10-2021 | Tetrad analysis, somatic cell hybridization for gene linkage studies, Hereditary defects. |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | Molecular mechanisms of DNA repair, mutations frequency, correlation between mutagenicity and carcinogenicity, |
| Week 13 | 08-11-2021 to 13-11-2021 | Population genetics: Hardy-Weinberg equilibrium, gene and genotypic frequencies, Chisquare test, probability, pedigree analysis. |
| Week 14 | 15-11-2021 to 20-11-2021 | Basic microbial genetics: Conjugation, transduction, transformation, |
| Week 15 | 22-11-2021 to 27-11-2021 | isolation of auxotrophs, replica plating techniques, analysis of mutations in biochemical pathway, one gene – one enzymehypothesis. |
| Week 16 | 29-11-2021 to 30-11-2021 | Extra chromosomal inheritance: mitochondrial and chloroplast genetic systems. |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2021-2022)**

**Class: BTH 5th sem Name of the Teacher: DR SMITA**

**Subject: MOLECULAR BIOLOGY Period : 1(M)2(M,W,F,S) 4 (W)**

**Paper :THEORY Room No : 127**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | Introduction |
| Week 2 | 16-08-2021 to 21-08-2021 | Evidence & experiments DNA as genetic material |
| Week 3 | 23-08-2021 to 28-08-2021 | 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 | 31-08-2021 to 04-09-2019 | Genome organization in prokaryotes: Molecular nature of the genetic material, Composition and structure of prokaryotic DNA and RNA. |
| Week 5 | 06-09-2021 to 11-09-2021 | Genome organization in eukaryotes: Composition and structure of eukaryotic DNA and RNA. |
| Week 6 | 13-09-2021 to 18-09-2021 | Composition and structure of eukaryotic DNA and RNA. Characteristic features of highly repetitive DNA, Tandem repetitive DNA and Mini and microsatellite DNA |
| Week 7 | 20-09-2021 to 25-09-2021 | Insertion sequences, Overview of central dogma |
| Week 8 | 27-09-2021 to 01-10-2021 | DNA replication: Prokaryotic DNA replication; replication origin and site and structure and DNA Ter regions |
| Week 9 | 04-10-2021 to 09-10-2021 | structure. DNA polymerases, composition and features, replication factors and the mechanism of replication, leading strand and lagging strand synthesis, procesessivity andfidelity. |
| Week 10 | 11-10-2021 to 16-10-2021 | Replication of single stranded DNA, M13 viral DNA. |
| Week 11 | 18-10-2021 to 19-10-2021 | Eukaryotic DNA replication; origins, replication initiation complexes and their assembly,licensing factors, DNA polymerases and their composition, |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | RNAs: types, rRNAs; Structural features of rRNAs- prokaryotic and eukaryotic. tRNAs: structural features, their anticodon |
| Week 13 | 08-11-2021 to 13-11-2021 | Transcription: regulatory elements and mechanism of transcription regulation in prokaryotes |
| Week 14 | 15-11-2021 to 20-11-2021 | Transcription: regulatory elements and mechanism of transcription regulation in prokaryotes |
| Week 15 | 22-11-2021 to 27-11-2021 | Translation: Overview and mechanism of translation process in prokaryotes, characteristics of the genetic code, structure and charging of tRNA, |
| Week 16 | 29-11-2021 to 30-11-2021 | 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 Odd Semester (For Ongoing Classes UG-PG)**

**Session (2021-2022)**

**Class: BSc Biotech (Elective) 3RD Sem Name of the Teacher: DR. SMITA**

**Subject: Biotechnology Paper: Introduction to Genetic Engg & Immuntechnology**

**Paper :THEORY Period :2 (Fri.Sat) Room No :**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | Introduction, |
| Week 2 | 16-08-2021 to 21-08-2021 | History and scope of rdna |
| Week 3 | 23-08-2021 to 28-08-2021 | .Gene cloning , why need to clone,dna modifying enzymes: endo/ exo nuclease, |
| Week 4 | 31-08-2021 to 04-09-2019 | Restriction enzymes |
| Week 5 | 06-09-2021 to 11-09-2021 | Ligase , phosphorylase,kinase, alkaline phosphatase, topoisomerase |
| Week 6 | 13-09-2021 to 18-09-2021 | Ligase , phosphorylase,kinase, alkaline phosphatase, topoisomerase |
| Week 7 | 20-09-2021 to 25-09-2021 | Isolation of DNA from animal plants and bacteria |
| Week 8 | 27-09-2021 to 01-10-2021 | Isolation of plasmid |
| Week 9 | 04-10-2021 to 09-10-2021 | Vectors / Host system ,E.coli plasmid vectors |
| Week 10 | 11-10-2021 to 16-10-2021 | E.coli plasmid vectors |
| Week 11 | 18-10-2021 to 19-10-2021 | Cosmid, BAC |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | Yeast vectors |
| Week 13 | 08-11-2021 to 13-11-2021 | Genomic DNA library & cDNA library, |
| Week 14 | 15-11-2021 to 20-11-2021 | Transformation and transfection, electroporation |
| Week 15 | 22-11-2021 to 27-11-2021 | Selection of recombinants / clone from library |
| Week 16 | 29-11-2021 to 30-11-2021 | PCR and applications |