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

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

**Session (2021-2022)**

**Class:** B.Sc. Biotech (Hons.) 2nd year (3rd Semester)

**Name of the Teacher: : Dr. Sunita Kumari**

**Subject:** Animal Cell Culture **Period:V(1-5),VII(3)**

**Room No : 111, 122**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | History of development of cell cultures, the natural surroundings for animal cells, |
| Week 2 | 16-08-2021 to 21-08-2021 | stimulating natural conditions for animal cells metabolic capabilities of animal cells, |
| Week 3 | 23-08-2021 to 28-08-2021 | Biology of cultured cells : The culture environment, cell adhesion, proliferation, differentiation, signaling, evolution of cell lines, Equipments and materials for animal cell culture technology |
| Week 4 | 31-08-2021 to 04-09-2019 | Introduction to the balanced salt solutions and simple growth medium. Brief discussion on the  chemical, physical and metabolic functions of different constituents of culture medium |
| Week 5 | 06-09-2021 to 11-09-2021 | Role of carbon dioxide. Role of serum and supplements. Serum & protein free defined media and their application |
| Week 6 | 13-09-2021 to 18-09-2021 | Animal cell culture Techniques: Dispersion and disruption of tissues; primary cultures,  anchorage and non-anchorage dependent cells |
| Week 7 | 20-09-2021 to 25-09-2021 | secondary culture, transformed animal cells, |
| Week 8 | 27-09-2021 to 01-10-2021 | Established/continuous cell lines, commonly used animal cell lines, their origin and  characteristics |
| Week 9 | 04-10-2021 to 09-10-2021 | Maintenance and growth kinetics of cells in culture, differentiation of cells |
| Week 10 | 11-10-2021 to 16-10-2021 | Measurement of growth and viability of cells in culture. |
| Week 11 | 18-10-2021 to 19-10-2021 | Cytotoxicity assays & their applications |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | Characterization of Cell lines and their authentication |
| Week 13 | 08-11-2021 to 13-11-2021 | Cell fusion and production of monoclonal antibodies. |
| Week 14 | 15-11-2021 to 20-11-2021 | Transformation and immortalization |
| Week 15 | 22-11-2021 to 27-11-2021 | cryopreservation |
| Week 16 | 29-11-2021 to 30-11-2021 | Bio-Safety & Bioethics |

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**Session (2021-2022)**

**Class:** B.Sc. Biotech (Hons.) 2nd year (3rd Semester)

**Name of the Teacher: : Dr. Sunita Kumari**

**Subject:** Immunology-I

**Period : I(5),III(5,6),V(6),VI(4),VII(7)**

**Room No : 122,127,111,122,122**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | **Introduction**  i) Overviews of immune system – Historical perspectives  ii) Innate and acquired immunity |
| Week 2 | 16-08-2021 to 21-08-2021 | Clonal nature of immune response.  **Cells of the immune system :** Hematopoiesis and differentiation |
| Week 3 | 23-08-2021 to 28-08-2021 | Lymphocyte trafficking, B-lymphocytes, T-lymphocytes, macrophages, dendritic cells, Natural killer cells and lymphocyte activated killer cells, eosinophils, neutrophils & mast cells |
| Week 4 | 31-08-2021 to 04-09-2019 | **Organs of the immune system :** Primary and secondary lymphoid organs, |
| Week 5 | 06-09-2021 to 11-09-2021 | Systemic function of immune system  **Lymphocyte Trafficking**: Cell surface proteins, Cell Adhesion molecules ( Integrin,  Selectin, Cadherin family and Ig Superfamily). |
| Week 6 | 13-09-2021 to 18-09-2021 | **Antigen** – Immunogenicity Vs. antigenicity, factors effecting immunogeneticity, nature  of immunogen, |
| Week 7 | 20-09-2021 to 25-09-2021 | epitopes, heptans and antigenicity, pattern recognition receptors |
| Week 8 | 27-09-2021 to 01-10-2021 | **Immunoglobulins:** Structure of antibody, antibody effector function, antibody classes  and biological activities, antigenic determinants on Immunoglobulins |
| Week 9 | 04-10-2021 to 09-10-2021 | Immunoglobulins superfamilies.  **Major histocompatibility complex:** General organization and inheritance |
| Week 10 | 11-10-2021 to 16-10-2021 | cellular distribution, regulation of MHC expression and disease susceptibility |
| Week 11 | 18-10-2021 to 19-10-2021 | antigen presentation, |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | Production of Monoclonal Antibodies, applications of  polyclonal and monoclonal antibodies |
| Week 13 | 08-11-2021 to 13-11-2021 | Strength of interaction, cross reactivity, antibody  affinity, avidity. |
| Week 14 | 15-11-2021 to 20-11-2021 | Antigen-antibody interactions as tools for research and diagnosis:  precipitation and agglutination reactions |
| Week 15 | 22-11-2021 to 27-11-2021 | Immunodiffusion, immunoelectrophoresis, immunoassays, Enzyme linked immunosorbent assay (ELISA), |
| Week 16 | 29-11-2021 to 30-11-2021 | Radioimmunoassay (RIA),Western blot, Immunofluorescence. |

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

**Session (2021-2022)**

**Class:** B.Sc. Biotech(Elective) 2nd year (3rd Semester)

**Name of the Teacher: : Dr. Sunita Kumari**

**Subject: Introduction to Genetic Engineering and Immunotechnology Period : III(1-4)**

**Room No : 219**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 11-08-2021 to 14-08-2021 | Immunotechnology  Basic Immunology: Types of immunity – innate, acquired, active and passive |
| Week 2 | 16-08-2021 to 21-08-2021 | Cells and tissues of immune system: Lymphoid cells, mononuclear cells |
| Week 3 | 23-08-2021 to 28-08-2021 | Lymphoid organs. |
| Week 4 | 31-08-2021 to 04-09-2019 | Antigen:- Immunogenicity, chemical composition, immunogen dosage |
| Week 5 | 06-09-2021 to 11-09-2021 | Haptens, adjuvants. |
| Week 6 | 13-09-2021 to 18-09-2021 | Antibody structure, |
| Week 7 | 20-09-2021 to 25-09-2021 | Antibody structure, function and types |
| Week 8 | 27-09-2021 to 01-10-2021 | Antibody diversity, Ig Domains. |
| Week 9 | 04-10-2021 to 09-10-2021 | Ag-Ab interactions – Cross reactions |
| Week 10 | 11-10-2021 to 16-10-2021 | Precipitation and agglutination. |
| Week 11 | 18-10-2021 to 19-10-2021 | Immunological Techniques: Immunodiffusion, Immunoelectrophoresis |
| **Mid Semester Exam (21st October 2021 – 30th October 2021)** | | |
| Week 12 | 01-11-2021 to 06-11-2021 | Major Histo-compatibility complex (MHC), MHC restriction, regulation |
| Week 13 | 08-11-2021 to 13-11-2021 | Antigen presentation and processing antigen presenting cells, |
| Week 14 | 15-11-2021 to 20-11-2021 | Cell mediated subset of T-cells, Cytotoxic helper and suppressor cells. |
| Week 15 | 22-11-2021 to 27-11-2021 | Cell mediated and humoral immunity, antibody dependent cell mediated cytotoxicity |
| Week 16 | 29-11-2021 to 30-11-2021 | Natural killer cells. |