I – Academic Planner

E. Teaching Plan (Year : 2020-2021 , Semester: Odd (I, III, V))

Teacher's Name: Dr. Archana Singh Department: Botany

S. No.	UPC	Paper Name	Core/AECC/GE/SEC	Topic/Unit	Start Date	End Date
1	32161501	Reproductive Biology of Angiosperms (THEORY)	Core	Unit 2: Anther (Microsporogenesis, Callose deposition	11 Aug 2020	19 Aug 2020
				Unit 3:Pollen Biology (Microgametogenesis, Male Germ Unit and Pollen wall, Pollen morphology, Palynology and its scope, Pollen sculpture and rare features of pollen, NPC and Scope of Palynology , Pollen germination, Pollen Viability and storage)	25 Aug 2020	16 Sep 2020
				Unit 4: Ovule (Structure and Types, Special features of ovule, Megasporogenesis, Megagametogenesis, Mature embryo sac , Ultrastructure of Egg, synergids,antipodal, central cell, Types of embryo sac and FGU)	22 Sep 2020	13 Oct 2020
				Test and revision	13 Oct 2020	13 Oct 2020
				Unit 7: Endosperm (Structure and Function, Endosperm Development, Types of Endosperm ,	20 Oct 2020	3 Nov 2020

				Endosperm Structure and Function) Unit 10: Polyembryony (Polyembryony classification, Causes of Polyembryony, Application of Polyembryony, Apomixis, Causes of Apomixis) Revision	4 Nov 2020 25 Nov 2020	24 Nov 2020 25 Nov 2020
2	32161501	Reproductive Biology of Angiosperms (PRACTICAL)	Core	Exp 1: Anther Exp 2: Ovule Types Exp 3: MGU, Exp 4:Pollen Wall structure, Exp 5: Special structure of pollen Exp 6: Special features of Ovule Exp 7: Pollen sculpturing pattern and aperture types Exp 8: Seed dispersal mechanism Exp 9: Female gametophyte Exp 10: Mature egg apparatus Exp 13: Development of embryo Exp 11: Suspensor Exp 12: Intra ovarian ant In Vivo Pollination Exp 14: Hanging drop method of pollen germination Exp 15: TTC test of pollen Exp 16: Dissection of embryo Exp17: Dissection of endosperm Revision and Mock Test	10 Aug 2020 (Every Monday at 12.40pm to 4.40 pm) 23 Nov 2020	23 Nov 2020 23 Nov 2020
3	32161102	Biomolecules and Cell Biology (THEORY)	Core	Unit 4: The Cell (Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin ofeukaryotic cell (Endosymbiotic	24 Nov 2020 (Every Wednesday at 10.40am	24 Nov 2020

				theory) Unit 5: Cell wall and plasma membrane (Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis) . Unit 6:Cell Organelles Nucleus: Structure and Function, Nuclear Pore Complex and DNA packaging in eukaryotes, Nucleolus) Mitochondria structure and function Chloroplast structure and function Peroxisomes and glyoxisomes ER structure and function Golgi apparatus and structure and function Lysosomes : structure and function, Cytoskeleton Unit 7: Cell cycle and its regulation Mitosis and Meiosis	to 12.40 pm) 2 Dec 2020 23 Dec 2021 24 Feb 2021	 16 Dec 2020 17 Feb 2021 3 March 2021
4	32161102	Biomolecules and Cell Biology (PRACTICAL)	Core	Exp 1. Study of plant cell structure with the help of epidermal peel mount of Onion/Rhoeo/Crinum. Exp 2. Study the phenomenon of plasmolysis and deplasmolysis. Exp 3. Demonstration of the phenomenon of protoplasmic streaming in Hydrilla leaf.	23-11-2020 (On every Monday)	15-02-2021

				Exp 4. Study different stages of mitosis. Exp 5. Separate chloroplast pigments by paper chromatography. Exp 6. Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins. Exp 7. Study of cell and its organelles with the help of electron micrographs. Exp 8. Study the effect of organic solvent and temperature on membrane permeability. Exp 9. Demonstrate the activity of Urease Exp 10. Demonstration of the activity of Catalase Exp 11. Demonstrate the activity of Amylase		
5	42167902	Cell and Molecular Biology (THEORY)	DSE	Unit 2: Cell as a unit of Life Unit 3: Cell Organelles • Nucleus Structure and Function, Nuclear Pore Complex and DNA packaging in eukaryotes, Nucleus Structure and Function, Nucleolus and Ribosome • Mitochondria structure and function • Chloroplast structure and function • ER structure and function • Golgi apparatus and structure and function • Lysosomes : structure and function • Peroxisomes and glyoxisomes Unit 4: Cell memberane and cell wall	13 Aug 2020 27 Aug 2020 27 Aug 2020 17 Sep 2020 24 Sep 2020 1 Oct 2020 8 Oct 2020 15 Oct 2020 22 Oct 2020 29 Oct 2020 12 Nov 2020	20 Aug 2020 22 Oct 2020 10 Sep 2020 17 Sep 2020 24 Sep 2020 1 Oct 2020 8 Oct 2020 15 Oct 2020 22 Oct 2020 5 Nov 2020 26 Nov 2020

				Unit 5: Overview of Cell cycle, Mitosis and Meiosis; Molecular controls.		
6	42167902	Cell and Molecular Biology (PRACTICAL)	DSE	Exp 1: Study of prokaryotic cell and eukaryotic cell Exp 2 & 3: Study of striated muscle fiber and squamous epithelial cell Exp 4 : Study of plant cell Exp 5: Demonstration of Plasmolysis Exp 6: Study of cell organelles (Nucleus, Mitochondria, Choloroplast, Golgi apparatus) Exp 7: Mitosis Exp 8: Meiosis Exp 9 & 10: Study of NPC, special chromosome and DNA packaging Exp 11 & 12: Effect of organic solvent & temperature on semi permeability nature of membrane Exp 13: :Demonstration of Dialysis Exp 14: Preparation of karyotype and ideogram Exp 15: Measurement of cell size using micrometry Practical Revision Practical Mock Test	14 Aug 2020 (Every Friday at 12.40pm to 4.40 pm)	21 Nov 2020
7	32165302	GE 3- Environmental Biotechnology (THEORY)	GE-3	Unit 4: Xenobiotic compounds - organic (chlorinated hydrocarbons, substituted simple aromatic compounds, polyaromatic hydrocarbons, pesticides, surfactants) and inorganic (metals, radionuclides, phosphates, nitrates). Bioremediation of xenobiotics in environment - ecological consideration, decay behavior and degradative plasmids, molecular techniques in bioremediation.	8 Sep 2020 (Every Tuesday at 12.40pm to 1.40 pm)	27 October 2020

				Unit 5: Role of immobilized cells/enzymes in treatment of toxic compounds. Biopesticides, bioreactors, bioleaching, biomining, biosensors, biotechniques for air pollution abatement and odour control	3 November 2020	24 November 2020
8	32165101	GE I- Biodiversity (Microbes, Fungi, Algae and Archegoniates) (THEORY)	GE-I	Unit 4: General features of Bryophytes, pteridophytes and gymnosperms Unit 4c: Morphology, anatomy & Reproduction of *Cycas* & *Pinus* Unit 4: Economic importance of *Cycas* and *Pinus* Unit 4b: Morphology, anatomy & Reproduction *Pteris*	23 December 2020 (Every Wednesday at 12.40 to 1.40 pm)	3 March 2021
9	32181102	Environmental Science	AECC	Unit 5 Environmental pollution: Environmental pollution (Air, water, soil, thermal and noise): causes, effects and controls; Air and water quality standards Nuclear hazards and human health risks Solid waste management: Control measures of urban and industrial waste Pollution case studies: Ganga Action plan (GAP), Delhi air pollution and public health issues etc Unit 7: Unit 7 Human Communities and the Environment:(Human population growth: Impacts on environment, human health and welfare Resettlement and rehabilitation of project affected persons; case studies Disaster management: floods, earthquake, cyclones and landslides Environmental movements)	29 Jan 2021 (Every Friday at 1.40 to 2.40 pm)	5 March 2021

A. Teaching Plan (Year : 2020-2021, Semester: Even (II, IV, VI))

Teacher's Name: Dr. Archana Singh Department: Botany

S. No.	UPC	Paper Name	Core/AECC/GE/SEC	Topic/Unit	Start Date	End Date
1	32167601	Industrial & Environment Microbiology (THEORY)	DSE	Unit 1 : Scope of microbes in industry Unit 2: Bioreactors/Fermenters and fermentation processes ,Solid state and liquid state fermentations , Fermenters and typical components of bioreactor, Batch and continous fermentation, Fermenters types –constantly stirred tank fermenter, Tower Fermenters , Fixed bed and Fluidized bed Fermenters Air Lift fermenter	8 January 2021 (Every Friday at 9.40am to 10.40 am)	23 April 2021
1	32167601	Industrial and Environment Microbiology (DSE paper) (PRACTICAL)	DSE	Exp 1: Principle and functioning of instruments in microbiology Exp 2: Preparation of media (PDA and CDA) Exp 3: Study of VAM from root Exp 4: Study of Rhizobium from leguminous plants Exp 5: Alcohol production by yeast Exp 6: Serial dilution method for isolation of microbes from water and soil and study of aeromicroflora Exp 7: Hydrolysis of casein / starch Exp 8: Study of Coliform bacteria from water sample using methylene blue medium	7 January 2021 (Every Thursday at 12.40 to 4.40 pm)	29 April 2021
2	32161402	Ecology (THEORY)	Core	Unit 1: Introduction :Brief History, Basic concepts, Levels of organization, Interrelationships between the living world and	5 January 2021 (Every	27 April 2021

				the environment, the components and dynamism, homeostasis (with reference to Ecosystem) Unit 2: Soil :Importance; Origin; Formation; Composition: Physical, Chemical and Biological components; Soil profile; Role of climate in soil development. Unit 3: Water :Importance; States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table Unit 2: Soil profile Unit 4: Light, Temperature, Wind and Fire Variations; adaptations of plants to their variation. Unit 7: Plant Communities: Concept of ecological amplitude; Habitat (types) and Ecological niche (types); Community characters (analytical and synthetic); Ecotone and edge effect; Methods to studying vegetation; Dynamics of communities; Succession: processes, types (Lithosere, Hydrosere); climax concepts.	Tuesday at 1.40 to 3.40 pm)	
2	32161402	Ecology (PRACTICAL)	Core	Exp. 1. Study of instruments used to measure microclimatic variables.. Exp. 2. Determination of pH of various soil and water samples Exp. 3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.	5 January 2021 (Every Thursday at 8.40am to 12.40 pm)	27 April 2021

				Exp 4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method. Exp 5. Comparison of bulk density, porosity and rate of infiltration of water in soils of three habitats. Exp. 6. Determination of dissolved oxygen of water samples from polluted and unpolluted sources. Exp. 7 (a). Study of morphological adaptations of hydrophytes and xerophytes . Exp. 7(b). Study of biotic interactions Exp. 8. Determination of minimal quadrat size for the study of herbaceous vegetation. Exp. 9. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law. Exp. 10. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus		
3	32161202	Archegoniatae (THEORY)	Core	Unit 1: Unifying features of archegoniates Unit 1: General features of Bryophytes, pteridophytes and gymnosperms Unit 4: Morphology, anatomy of *Cycas* Unit 4: Reproduction of *Cycas* Unit 4: Morphology, anatomy of *Pinus* Unit 4: Reproduction in *Pinus* Unit 4: Economic importance of *Cycas* and *Pinus* Unit 4: Similarity and dissimilarity between gymnosperms and other groups Unit 3: *Equisetum*- morphology and anatomy	7 April 2021 (Every Wednesday at 9.40am to 11.40 am)	28 July 2021

				Unit 4: *Gnetum*- morphology and anatomy Unit 3: *Equisetum*- reproduction Unit 3: Telome Theory, Rhynia and Cooksonia Unit 4: *Gnetum* Reproduction Unit 4: *Sellaginella* Unit 3: *Pteris* Unit 4: Similarity between *Gnetum* and other genera Revision- Bryophytes**,** Gymnosperms and Pteridophytes		
3	32161202	Archegoniatae (PRACTICAL)	Core	1. *Riccia* – Morphology of thallus. 2. *Marchantia*- Morphology of thallus, whole mount of rhizoids & Scales, vertical sectionof thallus through Gemma cup, whole mount of Gemmae, vertical section of Antheridiophore, Archegoniophore, L.S. of Sporophyte 3. *Anthoceros*- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella), V.S. of thallus . 4. *Pellia, Porella* 5. *Sphagnum*- Morphology of plant, W.M. of leaf 6. *Funaria*- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores, antheridial and archegonial heads, longitudinal section of capsule and protonema. 7. *Psilotum*- Study of specimen, T.S. of synangium 8. *Selaginella*- Morphology, whole mount of leaf with ligule, transverse section of stem,whole mount of strobilus, whole mount of microsporophyll and megasporophyll longitudinal section of strobilus. 9. *Equisetum*- Morphology, transverse section of	5 April 2021 (Every Monday at 8.40am to 12.40 pm)	2 August 2021

				internode, longitudinal section ofstrobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry, T.S.of rhizome. 10. *Pteris*- Morphology, T.S. of rachis, V.S. of sporophyll, whole mount of sporangium, whole mount of spores T.S. of rhizome, W.M. of prothallus with sex organs and young sporophyte. 11. *Cycas*- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, V.S. of microsporophyll, W.M. of spores longitudinal section of ovule, transverse section of root 12. *Pinus*- Morphology (long and dwarf shoots, W.M. of dwarf shoot, male and female cones), T. S of Needle, transverse section of stem, L.S. of / T.S. of male cone, whole mount of microsporophyll, whole mount of Microspores longitudinal section of female cone, tangential longitudinal section &radial longitudinal sections stem. 13. *Gnetum*- Morphology (stem, male & female cones), T.S of stem, V.S. of ovule		

B. FDP/Seminar/Workshops/Lectures to be attended and/or to be conducted by Teachers

Event Topic		**Colours in Nature**			
Type / Nature (FDP/Webinar/Workshop etc.)		**Webinar**			
Organizing In-charge		Dr. RenuKathpalia, Kirori Mal College			
Details regarding invited Resource Person		Dr Geeta (Retd Gargi College)			
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	22 August	**Timing/s**	3 to 5	**Mode**	**Lecture**

Event Topic		**Machine Learning and Data Science for Biologists**			
Type / Nature (FDP/Webinar/Workshop etc.)		**Webinar**			
Organizing In-charge		Dr. Renu Kathpalia, Kirori Mal College			
Details regarding invited Resource Person		Gitanjali Yadav of NIPGR			
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	4 September 2020	**Timing/s**	3 to 5	**Mode**	Lecture

Event Topic	**Visual Note Taking**
Type / Nature (FDP/Webinar/Workshop etc.)	**Workshop**
Organizing In-charge	IQAC, Planning division, Dr BR Ambedkar University

Details regarding invited Resource Person	Mr, Zaid Ali Ulsagoff				
Nature of Participation (e.g. Invited Speaker, Participant etc.)	Participant				
Date/s	22 Sept 2020	**Timing/s**	11 – 12.30pm	**Mode**	Online Lecture

Event Topic	Innovations in Scientific Research Method				
Type / Nature (FDP/Webinar/Workshop etc.)	**FDP**				
Organizing In-charge	Dr.Anita Kamra and Dr. Renu Kathpalia				
Details regarding invited Resource Person	Prof.Diwan S. Rawat Department of Chemistry, University of Delhi Dr.Nipun Arora, Assistant Professor, Department of Mechanical Engineering, IIT, Jodhpur Dr.BalramPani, Dean of College, Principal, Bhaskaracharya College of Applied Sciences, University of Delhi Prof.ParamjitKhurana, Department of Plant Molecular Biology, University of Delhi				
Nature of Participation (e.g. Invited Speaker, Participant etc.)	Participant				
Date/s	14-18 Oct 2020	**Timing/s**	4.0 -6.0 pm	**Mode**	Online at G Meet

Event Topic	Carbon Sequestration & Solid Waste Management A Perspective
Type / Nature (FDP/Webinar/Workshop etc.)	**Workshop**
Organizing In-charge	Dr.RenuKathpalia&Prof.Rajni Gupta
Details regarding invited Resource Person	• **Dr.Lata**, IARI • **Dr.RatulBhaishya**, Dept. of Botany, University of Delhi

Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	5-8th Nov 2020	**Timing/s**	4.0 -6.0 pm	**Mode**	Online at G-Meet

Event Topic		**Save Earth Day**			
Type / Nature (FDP/Webinar/Workshop etc.)		Student activity			
Organizing In-charge		Department of Botany and Zoology, Kirori Mal College, University of Delhi.			
Details regarding invited Resource Person					
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Organizing team			
Date/s	22 April 2021	**Timing/s**	11-2	**Mode**	Online Events

Event Topic		**National Immunology day**			
Type / Nature (FDP/Webinar/Workshop etc.)		**Webinar**			
Organizing In-charge		Department of Zoology, Kirori Mal College, University of Delhi.			
Details regarding invited Resource Person		Dr. Chauhan			
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	29 April 2021	**Timing**/s	4- 6 pm	**Mode**	Online Lectures

Event Topic	**Environmental Audit**
Type / Nature (FDP/Webinar/Workshop	**FDP**

etc.)	
Organizing In-charge	Dr. Renu Kathpalia
Details regarding invited Resource Person	• **Prof. Vibha Dhawan**, DG, TERI. • **Prof. Mohanraj Rangaswamy**,Head of Department, Dept. ofEnvironmental Management,Bharathidasan University. • **Mr. Manmeet Rathore**, ESG,Impact Investment. • **Mr. Sanjay Kumar Jha**, IA&AS,DG, Audit (Environment &Scientific Department), CAGOffice • **Dr. Anil Kumar**,Ex-Director, Department ofEnvironment, Govt. of Delhi. • **Dr. D.R. Ravi**,Environment Officer, KSCPB. • Ms.Karishma Bisht, AdditionalDirector, FICCI, Delhi • **Dr. Anil P. Joshi**,Founder, HimalayanEnvironmental studiesConservation Organization (HESCO). • **Mr PuneetKaushik**, Founder Director,EHS Alliance Services • **Ms.Shweta Chahar**, ProjectConsultant, AECOM • **Mr. Sushil Kumar Sharma**, ex-GM, NTPC. • **Prof. Vandana Mishra**,Environmental Studies, DU. • **Prof. A.K. Nema,** IIT,New Delhi • **Dr. Bhuvan Chopra.** • **Dr. M. Dwarakanath**,.Ex-Director, DST, Govt. of Puducherry. • CA**. Amarjit Chopra**, Ex-President, ICAI. • **Mr. M.A Patil**, Sr. Director, FICCI.Delhi. • Mr Manish Raj • **Dr. Ratul Baishya**,Department of Botany,University of Delhi • Mr. J. S. Kamyotra,Member Secretary, CPCB, New Delhi. • **Dr. S. Krishna Bharathi**, TUVRheineland Middle East office, Dubai. • **Dr. Anumita Roy Chowdhury**, Executive Director,Centre for Science & Environment.

		• **Mr. Rajiv Ranjan Mishra**, DG,National Mission on Clean Ganga. • **Prof. Lokanath Mishra**,Director, FDC, Mizoram University.			
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	**28th June -2nd July 2021**	**Timing/s**	10 am – 5 pm	**Mode**	Online at G-Meet

Event Topic		**"Applications of Bioinformatics for Pedagogy of Plant Sciences"**			
Type / Nature (FDP/Webinar/Workshop etc.)		**Workshop**			
Organizing In-charge		Dr. Renu Kathpalia & Prof. Rajni Gupta			
Details regarding invited Resource Person		• **Dr. Hemant Ritturaj Kushwaha**, School of Biotechnology, Jawahar Lal Nehru University • **Prof. Sudeshna Mazumdar Leighton**,Department of Botany, University of Delhi			
Nature of Participation (e.g. Invited Speaker, Participant etc.)		Participant			
Date/s	22th -23rd July 2021	**Timing/s**	3 pm	**Mode**	Online at Zoom

C. Internal Assessment: House Exam (Test/Presentation etc.) &Assignment*

Course Code	Course Name	Unique Paper Code	Topic Name	Day and Date	Date/s of Exhibiting the Assessment Sheet to students, Discussing the marks, Returning/Retaining

556	B.Sc Botany (Hon) V Sem	32161501	Reproductive Biology of Angiosperms (THEORY) (Each student was given different topic for assignment from theory)	Assignment- 29 Sep 2020 Test-28 Oct 2020	Assignment- 13 Oct 2020 Test- 10 Nov 2020
556	B.Sc.(Hon) Botany I Sem	32161102	Biomolecules and Cell Biology (Theory)	Assignment on Friday 18-12-2020 Presentation -5 students per week on Thursday in extra period	
556	B.Sc.(Hon) Botany, I Sem	32161102	Biomolecules and Cell Biology (Practical)	Test- 5th March-2021	Test- 10th March-2021
586	B.Sc Life Science V Sem	42167902	Cell and Molecular Biology (THEORY)	Assignment- 15 Oct 2020 Test- 22 Oct 2020	Assignment- 5 Nov 2020 Test- 29 Oct 2020
		32165302	GE 3- Environmental Biotechnology (THEORY)	Assignment- 9 Nov 2020 Test- 10 Nov 2020	Assignment- 9 Dec 2020 Test- 9 Dec 2020
		32165101	GE I- Biodiversity (Microbes, Fungi, Algae and Archegoniates) (THEORY)	Test – 24 Feb 2021	Test – 24 Feb 2021
	B.A Prog	32181102	EVS (THEORY)	Test- 27 Feb 2021	Test- 27 Feb 2021

				Assignment- 27 Feb 2021	Assignment- 27 Feb 2021
556	B.Sc Botany (Hon) VI Sem	32167601	Industrial and Environment Microbiology (DSE paper) (THEORY) (Each student was given different topic for assignment from theory)	Test- 5 March 2021	Test- 20 March 2021
556	B.Sc Botany (Hon) IV Sem	32161402	Ecology (THEORY) (Each student was given different topic for assignment from theory for assignment)	Test 23 Feb 2021 Assignment: -16 March 2021	Test 24 Feb 2021 Assignment: 16 April 2021
556	B.Sc Botany (Hon) II Sem	32161202	Archegoniatae (THEORY)	Test & Assignment- 23 June 21 and 14 July 21	Test & Assignment- 24 June and 26 July 21

***Marks of the Internal Assessment to be submitted to the College 15 days before the last working day of every semester**

Dr. Archana Singh

Department of Botany