

SWAMI VIVEKANAND MAHAVIDYALAYA UDGIR

DEPARTMENT OF LIFE SCIENCES

TEACHING PLAN – WINTER 2017



Class:- M.Sc. Biotechnology First Year

Semester:-I

Paper Code & Title:- BT -I : Cell and Developmental Biology

Subject Teacher:- Miss. Kulkarni A.M.

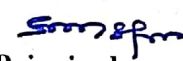
Sr.No.	Date	Day	Topic
			Unit I: Study of Cell & its architecture
1	19-Jun-17	Monday	f cell size and shape
2	20-Jun-17	Tuesday	History & Evolution
3	21-Jun-17	Wednesday	Cell & Cell Theory
4	22-Jun-17	Thursday	Structural organization of Prokaryotes
5	23-Jun-17	Friday	Structural organization of Eukaryotic
6	27-Jun-17	Tuesday	Biogenesis of Mitochondria
7	28-Jun-17	Wednesday	Structure of model membrane
8	29-Jun-17	Thursday	lipid bilayer and membrane protein diffusion
9	30-Jun-17	Friday	Osmosis, ion channels, active transport, membrane pumps
10	3-Jul-17	Monday	Regulation of intracellular transport
11	5-Jul-17	Wednesday	Electrical properties of membranes
12	6-Jul-17	Thursday	Cell wall, nucleus, mitochondria, Golgi bodies
13	7-Jul-17	Friday	Lysosomes, endoplasmic reticulum, peroxisomes, plastids
14	10-Jul-17	Monday	Vacuoles, chloroplast
15	11-Jul-17	Tuesday	Cytoskeleton and its role in motility

Unit II: Cell-Cell interactions

16	12-Jul-17	Wednesday	General principles of cell communication cell adhesion
17	13-Jul-17	Thursday	Gap junctions, extracellular matrix, integrin's
18	14-Jul-17	Friday	Neurotransmission and its Regulation
19	17-Jul-17	Monday	Hormones and their receptors,
20	18-Jul-17	Tuesday	Cell surface receptor, signaling through G protein
21	19-Jul-17	Wednesday	Signal transduction pathways
22	20-Jul-17	Thursday	Regulation of signaling pathways
23	21-Jul-17	Friday	Bacterial and plant two component systems
24	24-Jul-17	Monday	Light signaling in plants
25	25-Jul-17	Tuesday	Bacterial chemotaxis and quorum sensing
26	26-Jul-17	Wednesday	Regulation of hematopoiesis


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Unit III: Cell division & Cancer genetics

27	27-Jul-17	Thursday	Mechanism of cell division mitosis, meiosis and genetic recombination
28	28-Jul-17	Friday	Regulation of cell cycle
29	31-Jul-17	Monday	Factors and genes regulating cell cycle
30	1-Aug-17	Tuesday	Genetic rearrangements in progenitor cells
31	2-Aug-17	Wednesday	Oncogenes, tumor suppressor genes, cancer and the cell cycle
32	3-Aug-17	Thursday	Virus-induced cancer, metastasis
33	4-Aug-17	Friday	Interaction of cancer cells with normal cells
34	7-Aug-17	Monday	Apoptosis, therapeutic interventions of uncontrolled cell growth

Unit IV: Developmental Biology


35	8-Aug-17	Tuesday	Gametogenesis, Fertilization
36	9-Aug-17	Wednesday	Cleavage, blastulation
37	10-Aug-17	Thursday	Gastrulation & formation of germ layers in animals
38	11-Aug-17	Friday	Concepts of competence, determination, commitment and differentiation
39	14-Aug-17	Monday	Plasticity in plant
40	16-Aug-17	Wednesday	Sex determination in plants & animals

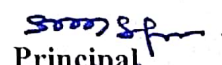
Unit V: Gene patterning & stem cells

41	18-Aug-17	Friday	Role of gene/s in patterning and development e.g. Arabidopsis thaliana
42	21-Aug-17	Monday	Role of gene/s in patterning and development Arabidopsis thaliana
43	22-Aug-17	Tuesday	Role of gene/s in patterning and development Drosophila melanogaster
44	23-Aug-17	Wednesday	Role of gene/s in patterning and development Drosophila melanogaster
45	24-Aug-17	Thursday	Stem cells
46	25-Aug-17	Friday	Stem cells




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Class:- M.Sc. Biotechnology First Year

Semester:-I

Paper Code & Title:- BT -II: Microbiology and Virology

Subject Teacher:- Mrs. Chillarge R.B.

Sr.No.	Date	Day	Topic
UNIT I: The Beginning of Microbiology:			
1	19-Jun-17	Monday	Controversy over spontaneous generation
2	20-Jun-17	Tuesday	Development of pure culture methods
3	21-Jun-17	Wednesday	Bacteria: Purple and green bacteria
4	22-Jun-17	Thursday	Cyan bacteria, Homoacetogenic bacteria
5	23-Jun-17	Friday	Budding and append aged bacteria, Spirilla
6	27-Jun-17	Tuesday	Spirochetes, Gliding and sheathed bacteria
7	28-Jun-17	Wednesday	Pseudomonades; Lactic and prop ionic acid bacteria
8	29-Jun-17	Thursday	Endospore forming rods and cocci
9	30-Jun-17	Friday	Mycobacterium, Rickettsia's
10	3-Jul-17	Monday	Chlamydia's and Mycoplasmas
11	5-Jul-17	Wednesday	Archaea: Archaea as earliest life forms,
12	6-Jul-17	Thursday	Halophiles, Methanogens, Hyper-thermophilic archaea

UNIT II: Methods in Microbiology

13	7-Jul-17	Friday	Theory and practice of sterilization
14	10-Jul-17	Monday	Principles of microbial Nutrition
15	11-Jul-17	Tuesday	Construction of Culture Media
16	12-Jul-17	Wednesday	Microbial Evolution
17	13-Jul-17	Thursday	Systematics and Taxonomy Evolution of earth and Earilist life
18	14-Jul-17	Friday	Primitive organisms and their metabolic strategies and molecular coding
19	17-Jul-17	Monday	New approaches to bacterial taxonomy classification
20	18-Jul-17	Tuesday	Ribotyping; Ribosomal RNA sequencing
21	19-Jul-17	Wednesday	Characteristics of primary domains
22	20-Jul-17	Thursday	Taxonomy Nomenclature and Bergey's Manual

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UNIT III: Microbial Growth

23	21-Jul-17	Friday	The definition of growth, Growth curve
24	24-Jul-17	Monday	Measurement of Growth and growth yields
25	25-Jul-17	Tuesday	Synchronous growth: Continuous culture
26	26-Jul-17	Wednesday	Growth as affected by Environmental factors like temperature, acidity,
27	27-Jul-17	Thursday	Growth as affected alkalinity, water availability and oxygen

UNIT IV: General virology

28	28-Jul-17	Friday	Discovery of viruses
29	31-Jul-17	Monday	Nomenclature, Classification, Structure of viruses
30	1-Aug-17	Tuesday	Morphology and ultra structure
31	2-Aug-17	Wednesday	Virus receptors & entry into cell
32	3-Aug-17	Thursday	Virus related agents Overview of viral replication
33	4-Aug-17	Friday	Assembly, Maturation & release from cell
34	7-Aug-17	Monday	Diagnostic Virology; Cultivation of viruses in embryonated eggs
35	8-Aug-17	Tuesday	Virus cultivation in animal cells and experimental animals
36	9-Aug-17	Wednesday	Transgenic system
37	10-Aug-17	Thursday	Virus infectivity Assay (chemical methods)
38	11-Aug-17	Friday	Virus infectivity Assay (physical methods)
39	14-Aug-17	Monday	PCR based diagnosis of viruses.
40	16-Aug-17	Wednesday	PCR based diagnosis of viruses.

UNIT V: Viruses

41	18-Aug-17	Friday	Life cycle of – Bacterial viruses (Lambda)
42	21-Aug-17	Monday	Life cycle of – Bacterial viruses (M13)
43	22-Aug-17	Tuesday	Plant viruses (TMV)
44	23-Aug-17	Wednesday	Plant viruses (CMV)
45	24-Aug-17	Thursday	Animal viruses (Herpes)
46	25-Aug-17	Friday	Animal viruses (Retro)



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Semester:-I

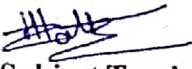
Paper Code & Title:- BT - III: Biochemistry

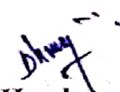
Subject Teacher:- Mr.Suryawanshi H.S.

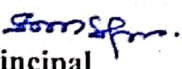
Sr.No	Date	Day	Topic
UNIT I: Chemical foundations of Biology-			
1	19-Jun-17	Monday	Structure of atoms, molecules and chemical bonds;
2	20-Jun-17	Tuesday	Ionization of water
3	21-Jun-17	Wednesday	Properties of water
4	22-Jun-17	Thursday	The pH scale, concept of acids and bases
5	23-Jun-17	Friday	Henderson- Hasselbach equation
6	27-Jun-17	Tuesday	Biological buffer systems
7	28-Jun-17	Wednesday	Thermodynamic principles in biology
8	29-Jun-17	Thursday	Concept of free Energy
9	30-Jun-17	Friday	Redox potential

UNIT: II Carbohydrates

10	3-Jul-17	Monday	Monosaccharide - Classification, occurrence
11	5-Jul-17	Wednesday	Monosaccharide - structure, function
12	6-Jul-17	Thursday	Properties of Monosaccharide
Oligosaccharide - Classification, occurrence			
13	7-Jul-17	Friday	Oligosaccharide - Structure, function
14	10-Jul-17	Monday	Oligosaccharide - Properties
15	11-Jul-17	Tuesday	Polysaccharides- Classification, occurrence
16	12-Jul-17	Wednesday	Polysaccharides - Structure, function
17	13-Jul-17	Thursday	Polysaccharides- Properties
18	14-Jul-17	Friday	Lipids: Classification, structure and functions
19	17-Jul-17	Monday	Triglycerides
20	18-Jul-17	Tuesday	Phospholipids
21	19-Jul-17	Wednesday	Steroids and terpenes.
22	20-Jul-17	Thursday	Glycolipids and lipoproteins
23	21-Jul-17	Friday	Role of lipids.


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UNIT: III Amino acids:

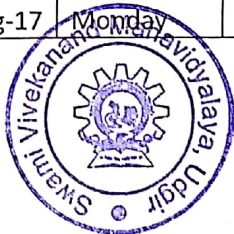
24	24-Jul-17	Monday	Classification and chemical reactions
25	25-Jul-17	Tuesday	Physical properties.
26	26-Jul-17	Wednesday	Peptide bond, peptide Classification
27	27-Jul-17	Thursday	Biologically important peptides.
28	28-Jul-17	Friday	Proteins: Properties and classification,
29	31-Jul-17	Monday	Primary Proteins
30	1-Aug-17	Tuesday	Secondary Proteins
31	2-Aug-17	Wednesday	Tertiary Proteins
32	3-Aug-17	Thursday	Quaternary Proteins
33	4-Aug-17	Friday	Structural comparison at secondary and tertiary levels
34	7-Aug-17	Monday	Ramachandran plot.
35	8-Aug-17	Tuesday	Enzymes: Historical perspectives
36	9-Aug-17	Wednesday	General characteristics, nomenclature
37	10-Aug-17	Thursday	Methods of isolation, purification and characterization of enzymes
38	11-Aug-17	Friday	Concept of enzyme assay, enzyme activity, coenzymes and isoenzymes

UNIT: IV Nucleic acids:

39	14-Aug-17	Monday	Primary, secondary and tertiary structure of nucleic acids
40	16-Aug-17	Wednesday	Double stranded DNA and biological significance
41	18-Aug-17	Friday	Forms of DNA, Physical properties of double stranded DNA
42	21-Aug-17	Monday	Types of RNAs and their biological significance
43	22-Aug-17	Tuesday	DNA Supercoiling.

UNIT: V Hormones

44	23-Aug-17	Wednesday	Structure and function
45	24-Aug-17	Thursday	Vitamins: Types, structure and functions
46	25-Aug-17	Friday	Prostaglandins; Silk fibroin
47	28-Aug-17	Monday	coiled coils, collagen triple helix and hemoglobin



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TEACHING PLAN – WINTER 2017

Class:- M.Sc. Biotechnology First Year

Semester:-I

Paper Code & Title:- BT- IV A: Techniques in Biology

Subject Teacher:- Dr.Gond D.S.



Sr.No.	Date	Day	Topic
			UNIT I : Microscopy:
1	19-Jun-17	Monday	Light microscope
2	20-Jun-17	Tuesday	Fluorescence microscope
3	21-Jun-17	Wednesday	Phase contrast microscope
4	22-Jun-17	Thursday	Electron microscope.
5	23-Jun-17	Friday	Centrifugation: Principles, RCF and Types of centrifuges
6	27-Jun-17	Tuesday	Types of rotors
7	28-Jun-17	Wednesday	preparative and analytical ultra-centrifuge
8	29-Jun-17	Thursday	Electrochemical techniques: Principles
9	30-Jun-17	Friday	Redox reactions
10	3-Jul-17	Monday	The pH electrode, ion-sensitive and gas-sensitive electrodes
11	5-Jul-17	Wednesday	The Clark oxygen electrode

UNIT II: Chromatographic techniques:

12	6-Jul-17	Thursday	Principles of chromatography
13	7-Jul-17	Friday	Ion-exchange and affinity chromatography
14	10-Jul-17	Monday	High performance liquid chromatography (HPLC)
15	11-Jul-17	Tuesday	Gas liquid chromatography (GLC)
16	12-Jul-17	Wednesday	Thin layer chromatography (TLC),
17	13-Jul-17	Thursday	Paper chromatography, GC-MS, LC-MS, Maldi Tof.
18	14-Jul-17	Friday	Electrophoresis: General principles, SDS-PAGE
19	17-Jul-17	Monday	Native gels, Gradient gel,
20	18-Jul-17	Tuesday	Iso electric focusing
21	19-Jul-17	Wednesday	2-D gel electrophoresis (2-D PAGE)
22	20-Jul-17	Thursday	Detection, estimation and recovery of proteins
23	21-Jul-17	Friday	Western blotting
24	24-Jul-17	Monday	Electrophoresis of nucleic acids: agarose gel
25	25-Jul-17	Tuesday	Electrophoresis of DNA
26	26-Jul-17	Wednesday	DNA sequencing gels, Pulse field gel electrophoresis,
27	27-Jul-17	Thursday	Capillary electrophoresis

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UNIT III: Spectroscopic techniques

28	28-Jul-17	Friday	Properties of electromagnetic radiation, interaction with matter
29	31-Jul-17	Monday	Gamma ray spectroscopy, Xray spectroscopy, UV and Visible spectroscopy
30	1-Aug-17	Tuesday	Infrared and Raman
31	2-Aug-17	Wednesday	Electron spin resonance spectroscopy, Nuclear magnetic resonance
32	3-Aug-17	Thursday	Circular dichorism spectroscopy, Atomic spectroscopy, x-ray diffraction
33	4-Aug-17	Friday	X-ray crystallography. Spectrofluorimetry, turbidometry and nephelometry.

UNIT IV : Radio isotope techniques:

34	7-Aug-17	Monday	The nature of radioactivity, detection and measurement of radioactivity:
35	8-Aug-17	Tuesday	Detection based on gas ionization
36	9-Aug-17	Wednesday	Geiger Muller counter- principles and applications.
37	10-Aug-17	Thursday	Detection based on excitation
38	11-Aug-17	Friday	Liquid Scintillation counter-principle and applications
39	14-Aug-17	Monday	Supply, storage and purity of radiolabelled compounds
40	16-Aug-17	Wednesday	Specific activity, inherent advantages and restrictions
41	18-Aug-17	Friday	Safety aspects, applications- of radio isotopes
42	21-Aug-17	Monday	Flowcytometry, ELISA, immunoblotting.

UNIT V: Biosensor

43	22-Aug-17	Tuesday	Principle, construction of biosensor
44	23-Aug-17	Wednesday	mechanism and applications of biosensor
45	24-Aug-17	Thursday	Enzyme based Biosensor
46	25-Aug-17	Friday	Cell Based Biosensor



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