

Dr. K. SURENDRAKUMAR

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Dept. of Microbiology

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Pudukkottai

ODD SEM (2022-2023)

Day order: 2

Day: 27.10.22

Hour: 2:11

Topic: Antiviral Agents.

* Molecular compounds - inhibit virus replication

* Natural products of plants, synthetic chemical compounds, interferons, vaccines, DNA vaccines and immunoglobulins etc..

* Antiviral compounds.

eg: Acyclovir, Amantadine, Cytarabine, Idoxuridine, Rimovirin, phosphonoacetic acid, Foscarnet etc..

* Interferons - protects the cells against the secondary viral infection.

Isaacs and Lindemann - 1959

* Interferons - antiviral agents
- inhibit the invading virus,
- They induce the biosynthesis

of enzymes - protein kinase, phosphodiesterase
when a virus enters the cell.

α - interferon (IFN- α)

β - interferon (IFN- β)

γ - interferon (IFN- γ)

7.11.22

Day order.

Hours: 2

Topic: RNA and its types.

* RNA carries genetic information that is translated by ribosomes into various proteins necessary for cellular processes.

Types:

mRNA

tRNA

rRNA

are the 3 main

types of RNA involved in protein synthesis.

* RNA also serves as the primary genetic material for viruses.

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PUDUKKOTTAI.

2022 - 2023

Odd Semester

Lesson plan note.

17.10.22

Do: II

How: I

Transgenic plants and animal :- Plants :-

- Ti Plasmid. - T-DNA.
- Insertion of gene into Plasmid using restriction enzyme and DNA ligase.
- Introduction into plant cells in culture.
 - T-DNA carrying new gene within plant chromosome.
- Regeneration of plant.
(plant with new trait).

Day order: I

27.10.22

How: V

Bioremediation:

- Biodegradation
- Bioaugmentation
- Bioaccumulation
- Biomagnification
- Biodeterioration

Biodeterioration of materials

- papers
- Leather.
- wood
- paint
- Textiles.

P.S. 14/12
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Rhodophyta.

Red algae (or) Rhodophyta, are one of the groups of eukaryotic algae.

Rhodophyta also comprises one of the largest groups of algae containing over 7,000 currently recognized species with taxonomic revisions on

The majority of species are found in florideae. Red algae abundant in marine habitats. Mostly consist of multicellular marine algae.

P. J. 21/4/20

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G.D.

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Dr. M. Anjugam

Do H	1	2	3	4	5
I		I-PG-Lab			VE
II	I-PG		I-PG		II-PG
III		II-PG		II-PG	I-PG
IV		I-PG		I-PG	
V	I-PG		II-PG	VE	
VI		II-PG	I-PG		VE

Dr. M. Anjugam

Assist. Professor

Department of Microbiology

Notes of Lesson

ODD-Sem - 2022 - 2023

Papers Handling

1. Environment and Agricultural Microbiology - II PG (6 hrs)
2. Advanced Microbiology - I PG (4 hrs)
3. Value Education. - II PG (3 hrs)
4. Lab - I-PG - Advanced microbiology, (3 hrs)

Sub Code: UGRMBMB3

Class: III B.Sc.

Unit I: Basic Chemistry

R. KRISHNAVENI,
Asst. Professor,
Department of microbiology,
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Even Semester (2022-2023)

Notes of Lesson.

D/H	1	2	3	4	5
I		III UN		III UN	I PH
II			EVS		III UN
III	←		III UN Lab.		I PH →
IV	III UN	I PH		I PH	
V		III UN	I PH		MLT
VI				EVS	

- 1) I - PH (MB) - Microbial Nanotechnology
- 2) III - UN (MB) - Bioinstrumentation
- 3) III - UN (MB) - Medical Lab Technology

Subject : Bioinstrumentation

Sub. code : U6RIMBMBE3

class : III VU (MB)

Unit I : Basic Chemistry

Acid, bases, buffers: measurements -

units of weights and volume: preparation

of solutions: calculation of concentration

and methods of expressing concentration

of solutions - normality and molarity

solutions. Basic instruments - balances,

pH meter, Laminar air flow chamber.

Unit II : Centrifugation

Preparative and Analytical centrifuges,

Sedimentation analysis RCF, Density

Gradient Centrifugation, Colorimetry -

Principle, Beer-Lambert's Law -

Applications.

Unit III : Spectroscopic Techniques;

Theory and Application of UV and

Visible Spectroscopy, Fluorescence Spectroscopy

MS, NMR, ESR, Atomic Absorption

Spectroscopy, Electrophoretic

techniques: Theory and Application of

PAGE, Agarose gel Electrophoresis

2DE, Iso-electric Focusing.

Unit IV : Chromatography Techniques!

Theory and Application of Paper

Chromatography, TLC, Gel filtration.

- They can also be used in Targeted drug delivery.
- protein detection.
- Reduced fluctuation in circulating drug delivery.

3/03/23

Day order : III

How : V

Disadvantages of Nanoparticle :-

Health risk :-

- The effects of inhaled nanoparticles in the body may include lung inflammation and heart problems.
- Studies in humans show that breathing in diesel causes a general inflammatory response and alters the system that regulates involuntary functions in
 - cardiovascular system.
 - Gastrointestinal track
 - Colon Cancer.

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Dr. M. Poojima
Assistant professor
Department of Microbiology

Notes of Lesson
Even Semester (2022 to 2023)

1) Microbial physiology and Metabolism (IUG)

2) Genetic Engineering (IIIUG)

Date: 12.12.2022

Day order: 1st

Hour: 1st

Introduction

→ All microbes have a need for three things: Carbon, energy and electrons.

→ There are specific terms associated with the source of each of these items, to help define organisms.

→ Nutrients are substances used in biosynthesis and energy release required for microbial growth.

Date: 13.12.2022

Day order: 2nd

Hour: 4th

Macronutrients

→ Macronutrients include nitrogen, oxygen, hydrogen, sulfur, and phosphorus and are used as building blocks for the cell.

→ Micronutrients are ionic forms the transition metals magnesium, potassium, sodium, calcium and iron.

Date: 14.12.2022

Day order: 3rd

Hour: 1st

Micronutrients

→ The vitamins required by most microorganisms are thiamine (B1), biotin (B7), pyridoxine (B6) and cyanocobalamin.

→ The cell growth and accumulation of metabolic products are influenced strongly by medium compositions.

Date: 11.01.23 Day order: 4th Hour: 4th

Liposome-Mediated Gene Transfer

- Liposomes are circular lipid molecules, which have an aqueous interior that can carry nucleic acids.
- Several techniques have been developed to encapsulate DNA in liposomes.
- On treatment of DNA fragment with liposomes, the DNA pieces get encapsulated inside liposomes.
- Lipofection is a very efficient technique and is used for the transfer of genes.

Date: 13.01.23 Day order: 6th Hour: 3rd

Microinjection

- DNA transfer by microinjection is generally used for the cultured cells.
- This technique is also useful to introduce DNA into large cells such as oocytes, eggs and the cells of early embryos.
- The term transfection is used for the transfer of DNA into eukaryotic cells, by various physical or chemical means.

Date: 18.01.23 Day order: 1st Hour: 5th

Particle Bombardment

- Gene gun bombardment is a method for the physical introduction of DNA into plant cells containing cell walls.
- The gene gun is utilized to bombard the plant cell wall with many DNA coated metal particles by using compressed helium as the propellant.

Papers

I. UG Allied - Biotechnology

II. PG Immunology and Immunotechnology

Dr. K. Surendra Kumar.

Asst. Prof.

Dept. of Microbiology.

Lesson plan.

Even Semester - 2022-2023

Biotechnology

Date: 12-12-22

Day order: I

Hour: II, III

Topic: Introduction to
Biotechnology - History

Biotechnology -

Life skillfully made study $\rightarrow$ Study of living tools.

* Application of technology to use, change, or improve the components or entire biological systems for benefit of mankind.

* Ancient Biotechnology - fermentation process
1900 - 1940.

Modern Biotechnology - after II world war.
1950 - until.

Karl Ereky - 1919 - Father of Biotechnology.

Date: 13-12-22

Day order: II

Hour: V

Topic: Multidisciplinary Tree.

Application of Biotechnology

* Green Biotechnology - Blue Biotechnology,
Yellow Biotechnology, White Biotechnology
and Red Biotechnology.

* Genetic Engineering, Tissue culture,
Cloning $\leftarrow$ Gene
Reproductive
Therapeutic cloning, etc...

* DNA Fingerprinting, Industrial production of
Penicillin. Vaccine development & Production

Date: 15-3-23

Day order: IV

Hour: IV

Topic: Biobleaching - Introduction.

* Biobleaching is another bioremediation process that involves the use of microorganisms to remove or extract toxic heavy metals from the soil.

* The presence of heavy metals in the soil in high concentrations can lead to serious health complications.

* Extraction of metals from their ores through the use of living organisms.

* Involve numerous ferrous iron and sulfur oxidizing bacteria.

Ex: *Acidithiobacillus ferrooxidans*
Acidithiobacillus thiooxidans

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H Q.No	1	2	3	4	5
I		II U4	I-P4		EVS
II	I P4			I P4	
III	I P4				II U4
IV		II U4-LAB EVS			
V		I P4	II U4		II U4
VI				II U4	

Dr. M. Anjugam

Assist. Professor

PG and Research Department of Microbiology

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Notes Lesson

Even - SEM - 2022 - 2023

Papers Handling

1. Environment and Agricultural Microbiology
2. Microbial Biotechnology.
3. Environmental Studies
4. Lab = II - U4 - Environment and Agricultural Microbiology

Date: 12.12.22 Dayorder: I

Hours: 1st and 3rd

⇒ Syllabus discussion

Unit - I ⇒ Definition, Introduction, scope and History of biotechnology & Enzym technology

Unit - II & III ⇒ Microbial products, Biofuel, Biochips and Biosensors

Unit - IV & V ⇒ Transgenic plants & animals
- Bioremediation

Date: 13.12.22

Dayorder: II

Hour: 1st and 4th

Topic: History and scope of Biotechnology.

⇒ Biotechnology is the application of biological organisms, system (or) processes to manufacturing and service industries.

⇒ 600 BC Sumarians and Babylonians knew the technique of preparing beer.

⇒ 2500 BC, Aryans started preparing curd.

⇒ 2000 BC Greeks were first to prepare cheese from milk.

⇒ 1822 - 1895 Louis Pasteur ⇒ Father of Industrial Biotechnology.

⇒ 1929 - Alexander Fleming discovered antibiotic

Date: 21.3.23

Day order: II

Hour: 1st & 4th

Topic - Xenobiotics

⇒ Xenobiotic is a term used to describe chemical substances that are foreign to animal life.

⇒ Include examples as plant constituents, drugs, pesticides, cosmetics, flavorings, fragrances, food additives, Industrial chemicals and environmental pollutants.

⇒ Types of Xenobiotics.

(i) Natural (ii) Synthetic (iii) Active

Date: 23.3.23

Day order: III

Hour: 1st

Topic: Bio-deterioration.

⇒ Any undesirable change in the properties of a material caused by the vital activities of living organisms is called bio-deterioration.

⇒ There are three main types of deterioration

(i) chemical ⇒ caused by organic and inorganic acids and chelating compounds.

(ii) Mechanical ⇒ caused by the growth of micro organisms.

(iii) fouling formation.

result of biofilm

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Ms. S. Vijaya Samoosleswari.

Asst. Prof.

Dept. of Microbiology.

Lesson Plan Note

Even Sem (2022-2023)

III UG - Industrial Microbiology.

[UBRIMBCC13]

Unit - I Historical background.

Historical development of Industrial Microbiology, Industrially important microorganisms. Major classes of products, Improvement of Industrially important microbial strains - auxotrophic mutants other genetic improvements.

Unit - II Fermenter design and media.

Design of a fermenter, types of fermenters and basic functions. Fermentation media - Seed culture media. Economic means of providing energy, Carbon, nitrogen, vitamin and mineral sources, role of buffers. Preservatives, inhibitors, inducers and antifoams.

Unit - III Downstream Process.

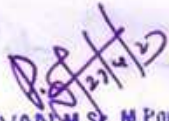
The recovery and Purification of fermentation products (Intracellular and Extracellular), cell disruption, precipitation, filtration, centrifugation. Solvent recovery, Chromatography, ultra centrifugation, drying cell immobilization and its applications.

17.3.23

Day order: VI

Hours: Lab.

Topic: Isolation of fungi
and bacteria from different
samples like. Urine. Sewage.
Respiratory Tract.


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