



ARULMIGU PALANIANDAVAR ARTS COLLEGE FOR WOMEN

(Autonomous)

(Re-Accredited with 'A' Grade by NAAC)

**(A Government Aided College - Affiliated to Mother Teresa Women's University,
Kodaikanal)**

CHINNAKALAYAMPUTHUR (PO), PALANI -624 615.

DEPARTMENT OF BOTANY



SYLLABUS

2016 – 2019

PAPER – I ALGAE AND BRYOPHYTES

Major Paper- I

Credits : 4

Hours : 6

Objectives :

1. To Learn about the cryptogamic plants .
2. To know the classification of Algae
3. To understand the diversity of Bryophytes complexity and the economic Value of lower plants .

A. Alage:

Unit – I

General Characters of Algae, Classification of Algae based on Fritsch Economic importance of Algae ; Brief account on ecology of algae.

Unit – II

Distribution, structure, reproduction and life history of the following types of Algae . (Need not study the development of sex organs)

- a) **Cyanophyceae – Osecillaria**
- b) **Chlorphyceae - Oedogonium**

Unit –III

- c) **Phaeophyceae – Sargassum**
- d) **Rhodophyceae – Polysiphonia**

B. Bryophytes

Unit –IV

General characters of Bryophytes, Brief account of Rothmaler’s classification Structure and reproduction of the following types. (Need not study the development of sexorgans, gametophyte and sporophyte)

Anthocerotopsida - Anthoceros

Unit – V

Bryopsida - Polytrichum

Practical : A study of the included in the Syllabus

Reference Books :

1. Fritsch F.E – The structure and reproduction of the Algae vol I and II
Vikas publications New Delhi.
2. Vashishta , B.R. Algae S. Chand and Co Ltd, New Delhi.
3. Bhatia K.M. A Treatise of Algae, R.Chand and co ., New Delhi.
3. Chopra G.D - A text book of Algae S. Nagin & Co , New Delhi.
- 4.Gupta .J.S. – Text book of Algae Oxford, JBH Publishing co ., New Delhi.
5. Singh .R.N – Role of Blue green Algae, Indian Council of Agricultural Research , New Delhi..
6. Watson W.V -The structure and life of Bryophyta Hutchinson University Library London .
7. Parihar .N.S. – Introduction to Bryophyta , Vol-I Central Book Depot, Allahabad
- 8.Pandey .B.P. College Botany – Algae , Fungi and Bryophytes, Vol- I S.Chand & Co , P.Ltd ., New Delhi.

I- B.Sc, Botany , I – SEMESTER

Paper – II FUNGI, LICHENOLOGY AND PLANT PATHOLOGY

Credits - 4

Hours : 6

Objectives :

1. To know the structure of bacteria and to understand their role in the environment
2. To understand the classification of Bacteria
3. To Know the etiology of the plant diseases.

A. FUNGI

Unit : I

Brief account of General characters of Fungi, Outline of the classification of Fungi by Alexopoulos, Economic importance of Fungi.

Unit : II

Occurrence, structure reproduction and life cycle of the following types

- Phycomycetes - Albugo
- Ascomycetes - Peziza

Unit : III

- Basidiomycetes - Puccinia
- Deuteromycetes - Cercospora

Unit : IV B. LICHENOLOGY

General types, Ecology and Economic importance of Lichens. Ecology of Lichens – Occurrence, structure and reproduction of Usnea

Unit : V C. PLANT PATHOLOGY

A study of the following plant diseases with special reference to the symptoms, casual organism, diseases cycle and control measures.

- a) Fungal disease - Red rot of Sugarcane
- b) Bacterial disease - Citrus canker
- c) Viral disease - Bunchy top of Banana

Reference Books:

- Alexopoulos , C.J and N.C ., Bold – Algae and Fungi, The Macmillan Co , Landon
- Gilbert M.Smith – Cryptogamic Botany , Vol –I , Algae and Fungi, New Delhi.
- Alexopoulos , C.J - Introductory Mycology, John Wiley & Sons, New York.
- Vashishta B.R. , Botany for Degree students part – II – Fungi, S.Chand -& Co.,
- Chopra, G.L. - A text book of Fungi, S. Nagin & Co ., New Delhi.
- Munkur. B.B - Fungi and plant diseases
- Singh . R.S. – Principles of plant pathology, Oxford , IBH Publishing Co., New Delhi.
- Rangaswami. G. – Diseases of Group plants in India
- The Biology of Lichens - M.E. Hake.
- Lichens, Ahamed Geon

I – B.Sc, BOTANY - 1ST – SEMESTER

SBC - BIO FERTILIZERS

PART – IV

Credits : 2

Hours : 2

Unit : I

Bio fertilizers – scope , Importance and need Symbiotic bacterial inoculants Rhizobium , isolation, packing and storage, Field applications of Inoculants and crop Response

Unit : II

Non – Symbiotic bacterial inoculants – Azotobacter – isolation – field application of Inoculants –crop Response

Unit : III

**Blue green algae inoculants –isolation , storage –field application and crop response
Azolla – A green manure cum bio fertilizers – Mass cultivation, field application and uses**

Unit : IV

Vesicular and Arbuscular Mycorrhizae – Mass cultivation of Vam Fungi isolation and Importance field applications

Unit : V

Mycorrhizae – mass multiplication – Role of mycorrhizae in agriculture as organic manures and Green manures.

Reference Books :

- **Dubey .R.C . 2002 - A Text book of Biotechnology S.Chand and Co , New Delhi.**
- **Subba Rao N.S. 1988 , Bio fertilizers in agriculture , second edition, Oxford & IBH Publishing Co , Pvt Ltd , New Delhi.**
- **Subba Rao .N.S. 1982. Advanced agricultural Microbiology , Oxford & IBH Publishing Co, New Delhi.**

I- B.Sc, BOTANY II - SEMESTER

PAPER - III – PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

Credits - 4

Hours : 6

Objectives :

1. To understand the classification of Pteridophytes and Gymnosperms.
2. To identify the various forms of Pteridophytes .
3. To differentiate various members of Gymnosperms.
4. To know the fossil forms.

A. PTERIDOPHYTES :

Unit – I

General characters and classification of the Pteridophytes . (smith) Stelar Evolution of Pteridophytes. Homospory, Heerospory, Apospory & Apogamy, Leptosporangiate and Eusporangiate – Definitions only with examples .

Structure and reproduction of the following types. (Need not study the development of sex organs, Gametophyte)

Psilotales - Psilotum

Lycopodiales - Lycopodium

Unit – II

Filicales - Gleichenia , Marsilea

B. GYMNOSPERMS :

Unit- III

General characters, and Classification of the Gymnosperms according to Chamberlain.

Coniferales - Pinus

Unit –IV

Gnetales - Gnetum

C. PALAEOBOTANY

Unit –V

Geological Time Scale formation and types of fossils

a) Psilophytales - Rhynia

b) Lepidodendrales - Lepidodendron

Practical : A study of the types included in the syllabus

Books for Reference :

- Sporne .K.R. – Morphology of Pteridophytes , B.J. Publications ,Madras.
- Pandey .B.P. – A text book of Botany (Bryophyta Pteridophyta & Gymnosperms) S.Chand & Co. NewDelhi.
- Parihar .N.S. – An introduction to embryophyta, Vol: II (Pteridophyta Central Book Dept , Allahabad)
- Vasishta .P.C – Botany for degree students – Pteridophytes, S.Chand & Co , New Delhi.
- Chopra G.L. & Verma – Gymnosperms, Pradeep Publications, Jalandhar .
- Sporne .K.R. –The morphology of Gymnosperms (B.J. Publications,Chennai.)
- Gupta M.N. – The Gymnosperms, Shivalal Agarwala & co ,Agra.
- Vasishta P.C. – Botany for Degree students, Gymnosperms S.Chand & co , New Delhi.
- Chester A.Arnold – An introduction to palaeobotany, Tata Mc . Graw Hill Publishing Co , Ltd , New Delhi.
- Shukla A.C & S.P. Mishra – Essential of Palaeobotany, Vikas Publishing House Ltd, New Delhi.

I – B.Sc , BOTANY - PRACTICAL PAPER – I

Algae, Bryophytes, Fungi, Lichenology, Plant Pathology, Pteridophytes, Gymnosperms, and Palaeobotany

- 1 . To make suitable micro preparations of the types prescribed in Fungi, Pteridophytes, and Gymnosperms
- 2 . To observe and identify Macroscopic and Microscopic specimens at sight and write illustrated and explanatory notes on them.
- 3 . To observe and identify at sight and make detailed study of the type of the diseases prescribed in the syllabus
- 4 . To maintain an observation note and to submit it for external valuation .

I – B.Sc , BOTANY MAJOR PRACTICAL

PAPER – 1 QUESTION PATTERN

**(Algae, Bryophytes, Fungi, Lichenology, Plant Pathology, Pteridophytes,
Gymnosperms, and Palaeobotany)**

Time : 3 Hours

Marks : 60

- 1 . Prepare suitable micropreparations of A,B and C stain and mount in Glycerine . Draw labelled sketches. Identify given reasons. Submit the slide for valuation (7X3=21)
- 2 . Spot at sight (Genus and group only) D.E.F and G (4X1 ½ = 6)
- 3 . Comment on the etiology of H (4)
- 4 . Draw sketches and write critical notes on and identifying giving reasons I.J.K.L. and M (5X3=15)
- 5 . Comment on 'N' (4)
- 6 . Observation note book (10)

KEY AND SCHEME VALUATION

1 . Algae, Bryophytes, Pteridophytes, Gymnosperm, materials to be given in A.B. & C

A. Algae / Fungi, B. Pteridophytes, C. Gymnosperms

Slide submission – 2 marks identification - 1 mark

Diagram - 2 marks Reasons - 2 marks = (7X3=21)

2 . Macroscopic specimens prescribed in the syllabus D.E.F.G, (Algae, Fungi or Lichen, Bryophytes, Pteridophytes and Gymnosperm)

Genus - 1 mark Group – ½ mark = (1½X4=6)

3 . H. Plant pathology specimen prescribed in the syllabus

Identification – 1 mark Casual Organism – 1 mark

Diagram – 1 mark Two symptoms - 1 mark = (1X4=4)

4 . Write critical notes

I,J,K,L, and M. – Cryptogramic slides

I – Algae , J- Fungi, K- Bryophytes , L- Pteridophytes, M- Gymnosperm

Identification – 1 mark Diagram – 1 mark Notes - 1 mark = (5x3=15)

5 . N. Fossil slide

Identification – 1 mark Diagram – 1 mark Notes - 2 mark = (1X4=4)

6 . Observation - 10 marks = 10

II – B.Sc, BOTANY - THIRD SEMESTER
PAPER – IV BIO CHEMISTRY AND BIOPHYSICS, BIO TECHNIQUES

A . BIO CHEMISTRY

Unit : I

Basic concepts of Biochemistry – Brief account of atoms, Bonds Ionic, hydrogen, co-valent and co- ordinate ,P and Buffer, structure and properties of water.

Unit : II

Biomolecules – structure , classification and properties of Carbohydrates Structure & Properties of Monosaccharides, Glucose, Disaccharides Sucrose , Polysaccharides – Starch Protein – Primary, Secondary , Tertiary Structure and Properties Lipids – Classification and properties structure of fatty acid

UNIT: III

Enzymes, structure properties, Nomenclature and classification, Mechanism of Enzyme action factors affecting enzyme action

B . BIOPHYSICS

UNIT : IV

Laws of Thermodynamics, concept of free energy, Redox potential, ATP as high energy compound

Photobiology Nature of Light, solar radiation, Absorption and emission, Fluorescence, phosphorescence and Bioluminescence.

C . BIO TECHNIQUES

UNIT:

Colorimetry and its use (Colorimetry PH meter and its use)

Centrifugation – Basic principles – types

Chromatography – Basic principles – types (Paper)

Reference Books :

- Conn E.E and Stumpf – outlines of Biochemistry, Wiley Eastern Ltd. Chennai.
- Lehinger A.L. Bio chemistry, Kalyani's New Delhi.
- Ambika Shanmugam – Fundamentals of Biochemistry for medical students – Chennai.
- Power C.B. and G.R Chatwal – Fundamentals of Biochemistry , S,Chand. & Co, New Delhi.
- Jain J.L. Fundamentals of Biochemistry S.Chand & Co New Delhi.
- Carey E.J. – Biophysics – affiliated East –west press P.Ltd. New Delhi.
- Albert .I Lechninger Bioenergetics – W.A Benjamin New York.
- Fuller etal – Biophysics – Concepts and Mechanics
- Dr. Salil Bose – Elementary Biophysics
- Jeyaraman, Kunthala ,M.Lakshmanan M. Gnananam and J.Jeyaraman - Experiments in Microbiology
- Higgim Bothams, Chennai
- Jeyaraman Techniques in Biology – A College level study
- Plummer D.T – An introduction to practical Biochemistry , Tata
- Mc.Graw Hill Publishing Co , Bombay.
- Asokan .V. Melvisharam – Biochemistry and Biotechniques

II – B.Sc, BOTANY - THIRD SEMESTER
NME – GARDENING AND NURSERY MANAGEMENT

credits : 2

Hours : 2

UNIT : I

Principles – Importance features of garden – kitchen garden – plan lay out principles of kitchen gardening

UNIT : II

Ornamental – Botanical garden – Components – Trophy ,Topiary , Hedges Edges, Borders, Arches, Lawn making, sunken garden , green house.

UNIT : III

Indoor gardening – Hanging pots – Bonsai – window Boxes – Potted plants –water Gardening – Rockery – Flower arrangement

UNIT : IV

Introduction types of nurseries and cultural practices –seed collection, selection of propagule materials, storage and treatment

Methods of Irrigation – Drop and sprinkler

UNIT : V

Planning and layout of orchards – cultivation methods for fruits crops cultivation of mango

Reference Books :

- Indian Vegetables Uma Shangar - 2013
- Ornamental Gardening ,Hari Krishna – 2012
- Garden Flowers, Vishnu Swarup – 2012
- Fruits , Ranjit Singh – 2013
- Vegetables, Bishvajit – 2013
- Garden , Laeeq Futhehally – (B.P) – 2013

II – B.Sc, BOTANY - FOURTH SEMESTER
PAPER – V - PLANT ANATOMY, MICROTECHNIQUES AND PLANT
ECOLOGY

UNIT : I

Cell wall - primary, secondary structure, Ultra structure and chemical composition

A very brief account of permanent tissues – (Parenchyma, Collenchyma, Sclerenchyma, Xylem & Phloem)

UNIT : II

Meristems – types, structure and functions of meristems – Root Apex and shoot Apex , theories of Apical Meristems

Primary structure of Dicot root and monocot Root and primary structure of Dicot stem and monocot stem

UNIT : III

Structure of Dicot and Monocot leaves – Normal secondary thickenings of Dicot stem and Dicot root

UNIT : IV

Anomalous secondary thickenings in Boerhaavia and Dracaena

Nodal Anatomy – A brief account – Unilacunar Node – Justicia , Trilacunar node – Azadirachta, Multilacunar node – Aralia .

UNIT : V

PLANT ECOLOGY

Study of the plant groups with special reference to their morphological, anatomical , and physiological adaptations :

- a . Hydrophytes
- b . Xerophytes
- c . Halophytes

Plant succession Hydrosere , Xerosere .

Reference Books :

- Arthur J.Eames and Lawrence – H. mac. Daniel : An introduction to plant anatomy, Tata Mc. Graw Hill Publishing ltd. New Delhi.
- Katherine . Easu : Plant Anatomy , Wile Eastern Pvt Ltd ., New Delhi.
- Vashishta P.C. Plant Anatomy , S. Nagin & Co New Delhi.
- Venkateswarlu .V. Internal morphology of Angioperms .
- Johanson, Microtechniques power Cell Biology
- Ambasht .R.S – A Text book of plant Ecology students friends & Co., Varashi.
- Sharama .P.D. Elements of Ecology Rastogi Publication, Meerut .
- Shukla R.S. and P.S. Chandel – plant Ecology and soil science, S.Chand and Co ., New Delhi.

II – B.Sc, BOTANY - FOURTH SEMESTER
PAPER – VI - MICROSCOPY , CELL BIOLOGY AND EMBRYOLOGY

A . MICROSCOPY AND CELLBIOLOGY

UNIT : I

Compound Microscope and Electron Microscope – TEM. SEM

Ultra structure of the Plant cell

UNIT : II

Structure and Function of Golgibody, Ribosomes, Nucleus Structure of Chromosomes.

UNIT : III

A Brief account of structure and function of Mitochondria, and Chloroplast, Cell Division – Mitosis and Meiosis.

B . EMBRYOLOGY

UNIT : IV

- Structure of Microsporangium, Microsporogenesis, Development of male gametophyte.
- Structure of Megasporangium- structure and development of female gametophyte – Polygonum.
- Double fertilization.

UNIT : V

- Endosperm types –Cellular Nuclear and Helobial, Ruminant (Haustoria not included)
- Dicot embryo –eg. Capsella , Monocot embryo – Luzula .
- Polyembryony, Apomixis, Parthenocarpy- only Definitions with examples.

Reference Books :

- Friedfelgr and David , Cell and Molecular Biology
- De Roberits E.D.P. Written W. Newinkshi & Franscis Co . a Sal2 –cell Biology –WB Saunders Company, London.
- Verma P.S. & V.K. Agarwal –cytology, S,Chand & Co , New Delhi.
- Carl .P.Swanson & Peter L.Webster – The cell ,Prentice Hall of India P.Ltd. New Delhi.
- Dnyansagar V.R. cytology and Genetics,Tata Mc.Graw Hill Publishing ltd. New Delhi.
- Burke .J.D. Cell Biology, Scientific Book agency , Calcutta
- Govinda Prakash Sharma, Reproductive Biology
- Maheswari.P. – Introduction to the Embryology of angiosperms, Tata Mc.Graw Hill Ltd. New Delhi.
- Bhogwani .S.S. & S.P. Bhatnagar – The embryology of Angiosperms, Vikas Publishing House p.Ltd, New Delhi. B.G.L.Swamy, From flower to fruit

II – B.Sc, BOTANY - FOURTH SEMESTER

PRACTICAL PAPER – II

Plant Anatomy, & Plant Ecology, Microscopy, Cellbiology, Embryology, Biochemistry, & Bio- Techniques

Plant Anatomy

- 1 . To make suitable micropreparations of the angiospermic materials – Dicot and Monocot stem, root & leaves .
- 2 . To draw labelled sketches of different types of microscope (Compound & Electron)

Cell Biology

- 3 . To smear root tip and identify different stages of mitosis .
- 4 . To smear young anther and identify different stages in meiosis
- 5 . To identify cell inclusions

Embryology

- 6 . To mound embryo (Tridax, Brassica)
- 7 . To study and write critical notes on permanent preparation showing development of anther, Embryosac and embryo.

Biochemistry

- 8 . Qualitative test for carbohydrates, proteins and fats.
- 9 . Measurement of PH of soil solutions.
- 10 . Preparation of Buffer.
- 11 . Estimation of starch in plant tissue – Gravimetric and Calorimetric.

Bio Techniques

- 12 . Determination of complementary colours and verification of Beer's law
- 13 . Estimation of Sugars in plant tissues – colorimetry
- 14 . Paper chromatography for separation of sugar, Aminoacids, Pigments, Dyes, Circular – Ascending , Column chromatography, separation of pigments.

Plant Ecology

- 15 . Identification of section stems and leaves of Hydrophytic xerophytic groups.
- 16 . Identification of morphological, ecological and biological interests of ecologically important plants.
- 17 . To maintain an observation note and to submit it for external valuation

II – B.Sc, BOTANY - MAJOR PRACTICAL PAPER- II

**Plant Anatomy, & Plant Ecology, Microscopy, Cellbiology, Embryology, Biochemistry,
& Bio- Techniques**

Time : 3 hours

Marks : 60

- 1 . Taking lots from the set of experiments. Write the procedure submit the procedure. Proceed with the experiment, tabulate and interpret the results. (10 Marks)
- 2 . Prepare transverse sections of 'A' and B Stain and mount in Glycerine Draw labelled sketches. Identify given reasons. Submit the slide for valuation (2X5=10)
- 3 . Make suitable micropreparations of 'C' Identify atleast any one stage and show it to the examiner for valuation (5 marks)
- 4 . Dissect and takeout the embryo from the material 'D' mount and submit it for valuation (5 marks)
- 5 . Write critical notes on E.F.G. and H (4X5=20)
- 6 . Observation Note Book (10 marks)

KEY AND SCHEME OF VALUATION :

- 1 . Experiments prescribed in the syllabus alone should be given (10 marks)
Experiment setup – 3, Procedure – 4, Tabulation and Interpretation- 3

- 2 . A. Anatomy materials to be given, B. Specimens of ecological interest Slide submission-
2,
Identification – 1, Diagram- 1, Reasons- 1 (2x5=10)

- 3 . Onion Root tip may be given or Rheo flower buds may be given in C identification and
submission of slides (notes need not be written) (5 marks)

- 4 . Any suitable materials such as Tridax, or Brassica to be given in D. Notes need not be
Written, Submission Slides (5 marks)

- 5 . Critical Notes on
E – any cell inclusion
F – Electron Photomicrograph of cell organelles.
G – Embryology Slide
H – Photograph of any one microscope
Identification – 1 mark, Sketch - 2 marks , Notes – 2 marks (4x5= 20)

- 6 . Observation Note Book (10 marks)

II – B.Sc, BOTANY - FOURTH SEMESTER

SBC - MUSHROOM FOR LIVELIHOOD

credits : 2

Hours : 2

Objectives :

- 1 . To understand the mushroom cultivation technique
- 2 . To understand the importance of mushroom as food

UNIT : I

Introduction – Morphology, Type of Mushroom, Identification of edible and poisonous mushrooms, scope of Mushroom cultivation.

UNIT : II

Nutritive value of common edible mushrooms life cycle of Agaricus and bisporous

UNIT : III

Cultivation Methods – Compost –Preparation spawn production – spawn running mulching, Harvesting

UNIT : IV

Diseases – Organisms and Protective measures – Post harvest technology – Freezing , Dry Freezing, Drying, Packing.

UNIT : V

Mushroom recipies, value added products marketing of mushrooms.

Reference Books:

- Nita Bahl 1996 Hand book on Mushrooms oxford and IBH Publishing Co.Ltd.
- Aneja K.R. 1993 Experiments in Microbiology, Plant Pathology, Tissue culture and Mushroom Cultivation Wishwa Prakasan, New Age International Ltd. New Delhi.
- Pathak V.N. yadav N. Goor .M. 2000, Mushroom Production and processing technology, Agrobios India Ltd.
- Kapoor.J.N. 1989 Mushroom cultivation ICAR , New Delhi.

III – B.Sc, BOTANY - V - SEMESTER
MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY
PAPER - VII

Objectives :

- 1 . To know the local flora and to classify them systematically**
- 2 . To learn the principles of systematics**

UNIT: I

Morphology – Modification of tap root system – Modification of stem – aerial and underground stem- Morphology of leaf : Inflorescence types- Racemose, Cymose, mixed and special types flower and Fruits – simple, aggregate and multiple fruits.

UNIT : II

Binomial Nomenclature – Herbarium technique – classification – Bentham & Hooker, Engler and Prantl : ICBN and its role. Botanical Survey of India (BSI) – Modern approaches - Chemo Taxonomy and Digital Taxonomy

UNIT : III

Study of following families with special reference to morphology of the modified plant parts and plants of Economic Importance

* Annonaceae, * Rutaceae , * Caesalpinaceae , * Cucurbitaceae , * Apiaceae

UNIT : IV

* Rubiaceae,* Asclepiadaceae, Lamiaceae , Amaranthaceae , Euphorbiaceae .

UNIT : V

* Orchidaceae * Arecaceae * Poaceae

ECONOMIC BOTANY :

Study of economically important plants of the above mentioned families with a special reference to the morphology of their uses.

Study of the extraction, chemical constitutions, and uses of the following

A . Coffee,

B . Rubber

III – B.Sc, BOTANY - V - SEMESTER

APPLIED MICRO BIOLOGY

PAPER – VIII

Objectives :

- 1 . To understand the basic concepts of microbiology
2. To know the structure of bacteria and virus and to understand their role in the environment.
3. To acquire knowledge on the application of microbiology .
4. To understand the uses of industrial microbiology .
5. To study the importance of soil microbiology of drinking water
6. To know about the human immune system

UNIT : I

Introduction to microbiology Definition and scope of microbiology Viruses – General characteristics structure and multiplication of TMV and Bactriophage Transmission of viruses. Symptoms and control of Rabies and AIDS

UNIT : II

Food microbiology – microbial flora of food – Food poisoning and food Infection Industrial manufacture of Ethanol Antibiotics – Penicillin, Vitamin B12, Aminoacids, Glutamic acid Production of SCP Industrial Effluent .

UNIT : III

Soil microbiology –soil micro – organism the Rhizophere micro organisms – Organic matter decomposition Humans functions of Humans. Microbial degradation of Cellulose .

UNIT : IV

Microbiology of Domestic water – Microbiology of drinking water, municipal water and sewage water – Brief account sewage treatment process. Determination of sanitary quality. Chemotherapy and control of micro- organisms through antibiotics

UNIT : V

Immunology – Basic principle of Immunology structure of antigen and antibody and their reaction . Types of Immunology – Antigen, Antibody- Definition, types Ag- Ab reaction. Types of Immunosystem Human Immune system . Immunization schedule (WHO)

Reference Books:

- Anathanarayanan and Paniker's Text book of Microbiology, Arti Kapil Publishing orient Blackswan – 2013
- A Text Book of Immunology, Rashmi A. Joshi – 2010
- General Microbiology vol – I Powar -2010
- General Microbiology vol – II Powar – 2010

III – B.Sc, BOTANY - V - SEMESTER
PLANT BIOTECHNOLOGY - ELECTIVE - I

Credits : 4

Hours : 5

Objectives :

To enlighten the students on the basic principles of the biotechnological innovations.

To understand the fundamental of DNA technology

To understand the role of vectors in recombinant DNA technology

To know the application of tissue culture in crop improvement

To Learn the application of plant Biotechnology

UNIT : I

Biotechnology – Definition, scope and importance of Biotechnology gene transfer in plants. Electroporation and micro- injection vector mediated gene Transfer PCR – principle, Tecnique Applcation and uses. DNA finger printing techniques in Biotechnology

UNIT : II

Recombinant DNA technology vectors, cosmid , transposans- Definitions Agrobacterium and genetic engineering in plant – Ti plasmids – Incorporation of TDNA into nuclear DNA Human health care . (a) Insulin (b) Human growth hormone (c) Antibiotics (d) vaccines

UNIT : III

Plant tissue culture – Culture techniques types of medium Regeneration of plants Root culture, Meristem culture, Anther culture, Role of tissue culture technology in crop improvements. Artificial seeds

UNIT : IV

Transgenic plants - Definition Transgenic plants for herbicide, pest, fungi, and viral resistance. Biological control of pathogens & weeds through genetically engineered microbes – B, Thuringiensis.

UNIT : V

Plant Biomass – Definition composition of biomass Biomass energy conversion, Bioenergy – Biofuels, Biodiesel and Biobutanol, Role of genetically recombinant microbes in pollution control – Pseudomonas. Intellectual property Rights.