

Course Title: Biodiversity (Microbes, Algae, Fungi and Archegoniates) - (Semester-I)

Course Code: BSBT101CCT

Scheme of Instruction

Total Duration : 60Hr

Periods /Week : 4

Credits : 4

Instruction Mode: Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation : 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: Study the diversity in habit, habitat and organisation of various groups of Microorganisms and plants like Algae, Fungi, Bryophytes and vascular cryptogams.

Course Outcomes: Students will understand the structure of Bacteria and Viruses. They understand the Morphological structure, reproductive structure of different groups of plants.

Unit	Course Content	Instruction Hours
1	<p>Unit 1 : Microbes (Virus and Bacteria) Viruses Discovery, general structure, replication (general account) DNA virus (T-Phage); Lytic and lysogenic cycles, RNA Virus (TMV), Economic importance. Bacteria-Discovery, General characteristics and cell structure, Reproduction –Vegetative, Asexual and recombination (Conjugation, transformation and transduction), Economic importance.</p>	15
2	<p>Unit 2 :Thallophytes: Algae General characters, thallus organization, structure , reproduction and classification. Life cycle of <i>Nostoc</i>, <i>Chlamydomonas</i>, , <i>Chara</i> , <i>Fucus</i> and <i>Polysiphonia</i>. Economic importance of Algae. Fungi General characters, cell wall composition, nutrition, reproduction and classification. Life cycle of <i>Saccharomyces</i>, <i>Pencillium</i>, <i>Puccinia</i>, <i>Alternaria</i> Symbiotic association Lichens. General account of Lichens and significance. Mycorrhiza : Ectomycorrhiza and Endomycorrhiza and their significance</p>	15
3	<p>Unit 3 : Archegoniates-I : (Bryophytes and Pteridophytes) Bryophytes General characters, adaptations to land habit, classification, Morphology, anatomy and reproduction of <i>Marchantia</i> and <i>Funaria</i>. Economic importance of bryophytes with special mention of <i>Sphagnum</i>. Pteridophytes General characters, Early land plants, classification. Morphology, structure and reproduction of <i>Lycopodium</i> and <i>Marselia</i>.</p>	15
4	<p>Unit 4 : Archegoniates –II (Gymnosperms) Gymnosperms General characters, Classification. Morphology, anatomy and reproduction of <i>Pinus</i> and <i>Gnetum</i>. Economic importance of Gymnosperms.</p>	15
Examination and Evaluation Pattern :		

Text Books and References :

1	Alexopolous C.J and Mims C.V 1998 Introductory Mycology, John Wiley and sons.	
2	Campbell, N.A and Reece.J.B (2008) Biology 8 th edition Pearson Benjamin Cummings San Francisco	
3	Dubey RC and K K Maheswary . A text Book if Microbiology : S Chand and Co. New Delhi.	
4	Pandey and Trivedi- A text book of Fungi , Bacteria and Virus, Vikas Publishing House, New Delhi	
5	A text book of Fungi byVashita	
6	Pelczar,M.J. (2001) Microbiology, 5 th edition, TataMc Graw Hi8ll Co, New Delhi.	

Course Title : Biodiversity (Microbes, Algae, Fungi and Archegoniates Lab.) - (Semester-I)
Course Code : BSBT150CCP

Scheme of Instruction

Total Duration : 60Hr

Periods /Week : 4

Credits : 2

Instruction Mode : Lecture /Demonstration

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives: To introduce the students about the diversity of organisms in the plant kingdom including Thallophytes, Bryophytes, Pteridophytes, Gymnosperms.

Course Outcomes: Students are expected to familiarise with Morphological, Reproductive structures of different plant groups. They can able to prepare temporary stained slides of vegetative, reproductive parts of the different plant groups and can identify

Unit	Course Content	Instruction Hours
	<ol style="list-style-type: none"> 1. Models of viruses-T phage and TMV, Photograph of Lytic and Lysogenic cycle. 2. Types of Bacteria from temporary /permanent slides/photographs, slides of Binary fission, conjugation and structure of root nodule. 3. Gram staining of Bacteria. 4. Study of vegetative and reproductive structures of <i>Nostoc</i>, <i>Chlamydomonas</i>, <i>Chara</i> , <i>Fucus</i> and <i>Polysiphonia</i> temporary preparations and permanent slides. 5. <i>Saccharomyces</i>, <i>Pencillium</i>, <i>Puccinia</i>, <i>Alternaria</i> Asexual and Sexual structures through permanent slides. 6. Section cutting of the following fungal disease material and identification of pathogens: <i>Puccinia</i> and <i>Alternaria</i>. 7. <i>Puccinia</i>: Black stem Rust of Wheat and infected Barberry leaves section mounts of spores on wheat and permanent slides of both the hosts. 8. <i>Saccharomyces</i> and <i>Pencillium</i> Asexual and sexual structures through permanent slides. 9. Lichens: Study of growth forms of lichens (Crustose, foliose and fruticose) specimens or slides. 10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs) 11. <i>Marchantia</i>-morphology of thallus, w.m rhizoids and scales. W.m gemmae (all temporary slides). Antheriodiphore , Archegoniophore, sporophyte (all permanent slides). 12. <i>Funaria</i>- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema., 13. <i>Marselia</i>: External morphology of sporophyte, anatomy of rhizome, petiole, and sporocarp. 14. <i>Pinus</i>: external morphology, T.s of needle and stem, reproductive structures(Male and female cones). 15. <i>Gnetum</i>: External morphology T.S of stem, reproductive structures (male and female cones). 	60Hrs

Examination and Evaluation Pattern :

Text Books and References :

1	Alexopolous C.J and Mims C.V 1998 Introductory Mycology, John Wiley and sons.
2	Campbell, N.A and Reece.J.B (2008) Biology 8 th edition Pearson Benjamin Cummings San Francisco
3	Dubey RC and K K Maheswary . A text Book if Microbiology : S Chand and Co. New Delhi.
4	Pandey and Trivedi- A text book of Fungi , Bacteria and Virus, Vikas Publishing House, New Delhi
5	A text book of Fungi byVashita
6	Pelczar,M.J. (2001) Microbiology, 5 th edition, TataMc Graw Hi8ll Co, New Delhi.
1	Campbell H.D. The Evolution of land plants (Embryophyta), Uni. Press, Stanford
2	Chopra R.N and P.K. Kumar, 1998, Biology of Bryophytes. Wiley Eastern Ltd New Delhi.
3	Parihar.N.S An Introduction to Bryophyta Central Book Depot, Allahbad., 1965
4	Sporne,K.R.1967 The Morphology Bryophytes, Hutchinson University Library, London.
5	Parihar,N.S. The Biology and Morphology of Pteridophytes,Central Book Depot. Allahabad.
6	O.P.Sharma. A Te4xt book of Pteridophyta Mac Millan India ltd. Delhi
7	Vashista PC Botany for Degree students-Gymnsperms , S.Chand and co. New delhi.
8	Bhatnagar, S.P and Alok Moitra 1997 Gymnosperms, New Age International (P) Ltd. Publisher, New Delhi
9	Clark KL 1976 Fossils, Palaeobotany and Evolution W.M.C.Brwon company New York.
10	Misra SP and Shukla AC 1982 Essentitals of Palaeobotany, Vikas Publishing House, New Delhi.

Course Title : Plant Anatomy and Embryology (Semester-II)

Course Code : BSBT201CCT

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 4

Instruction Mode: Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation: 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: Learn Anatomical structures and Functions of various tissues. Understand the Embryo and its structure, Embryo development in plants. To provide students with a fundamental understanding of study about the plant embryology.

Course Outcomes: students able to perform the transverse section of Root and Stem of monocot and dicot plants.

Unit	Course Content	Instruction Hours
1	Anatomy-I (Primary structure) Meristems Types, histological organization of shoot and root apices and theories. Tissues and Tissue Systems: Simple and complex Leaf : Stomata and epidermal outgrowths	15
2	Anatomy-II (Secondary growth and wood anatomy) Stem and root: Vascular cambium - Formation and function, normal secondary growth of stem. Anomalous secondary growth of stem of, <i>Boerhavia</i> , <i>Dracena</i> and Beet root Wood structure: General account. Study of local timbers Economic importance- <i>Teak and Red sanders</i> .	15
3	Reproductive Botany -I Introduction to Embryology. Anther structure, Microsporogenesis and development of male gametophyte. Ovule structure and types, Megasporogenesis ; types and development of female gametophyte.	15
4	Reproductive Botany -II Pollination - Types; Pollen - Pistil interaction. Fertilization. Endosperm - Development and types, embryo - development and types; Polyembryony and Apomixis - an outline. Palynology: Principles, pollen morphology and its applications.	15

Examination and Evaluation Pattern :

Text Books and References :

Text Books and References

1. Eames, A.J., & Mc Daniels, L.H.(1979) : An Introduction to Plant anatomy Tata-McGraw-Hill Publishing Co., (P) Ltd. Bombay, New Delhi. 14. Esau. K.(1980)
2. Plant Anatomy, (2nd Edition) Wiley Eastern Ltd., New Delhi.
3. Maheswari,P(1963) :Recent Advances in the Embryology of
4. Angiosperms(Ed.,) International Society of Plant Morphologists- University of Delhi.
4. Swamy. B.G.L. & Krishnamoorthy. K.V.(1980):From flower to fruit Tata McGraw Hill Publishing Co., Ltd., New Delhi.
5. Maheswari, P.(1985):An Introduction to the Embryology of Angiosperms Tata McGraw Hill Publishing Co.,Ltd., New Delhi.
- 6.. Bhojwani, S.S. & Bhatnagar, S.P. (2000) : The Embryology of Angiosperms (4th Edition) Vikas Publishing House(P)Ltd., UBS Publisher's Distributors, New Delhi.

Course Title: Plant Anatomy and Embryology Lab (Semester II)

Course Code: BSBT250CCP

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 2

Instruction Mode: Lecture / Demonstration

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives: Learn Anatomical structures and Functions Primary structure of stems and roots and also anomalous secondary growth of the stem and root. Understand the Embryo and its types.

Course Outcomes: After completion of the semester students able to perform the T.S of root and stem and also can differentiate the structure of root and shoot of monocot and dicot plants.

Unit	Course Content	Instruction Hours
	List of Experiments	
I.	Anatomical study of the following primary structure of stems and roots: Sunflower, Maize	
III.	Study of anomalous secondary growth of the following taxa: Stem: <i>Boerhavia, Dracaena</i> Root: Beet root.	
IV.	Microscopic studies: stomata types: <i>Anomocytic, Anisocytic, Paracytic and Diacytic.</i>	
V.	Study of different stages of anther development.	
VI.	Types of Ovules: <i>Orthotropus, Antropus, Hemi anatropus and Camphyloropus.</i>	
VII.	Dissection of embryos: <i>Dicot embryo and Monocot embryo.</i>	
VIII.	Study of pollen morphology of <i>Hibiscus, Acacia, and Grass.</i>	
		60Hrs
Examination and Evaluation Pattern :		

Course Title: Plant Ecology and Taxonomy (Semester III)

Course Code: BSBT301CCT

Scheme of Instruction
 Total Duration : 60 Hr
 Periods /Week : 4
 Credits : 4
 Instruction Mode: Lecture

Scheme of Examination
 Maximum Score : 100
 Internal Evaluation : 30
 End Semester : 70
 Exam Duration : 3 Hrs

Course Objectives: Learn about Environment and Environmental factors, types of Ecosystems. Understand the basic techniques in preparation of Herbarium and family description.

Course Outcomes: Learn about the techniques of developing Herbarium. Students able to write vegetative and floral characters of plants and students will come to know about the bio geographical zones and endemism phenomenon.

Unit	Course Content	Instruction Hours
1	<p>Unit 1: Introduction, Ecological factors and Plant communities: Introduction of Plant Ecology, Ecological factors like Soil, Water, Light and Temperature. Origin of Soil, formation, composition, Soil profile. States of water in the environment, precipitation types. Adaptation of hydrophytes and xerophytes. Plant Communities characters, Ecotone and edge effect, Succession processes and types.</p>	15
2	<p>Unit 2 : Ecosystem and phytogeography: Ecosystem structure, Energy flow, Food chains and Food webs, Ecological pyramids production and productivity, biogeochemical cycles, Carbon, Nitrogen and Phosphorous cycles. Principle biogeographical zones, Endemism.</p>	15
3	<p>Unit 3: Introduction to Plant Taxonomy and Herbarium: Identification, Classification, Nomenclature, Principles and rules(ICN), ranks and names, Binomial system, typification, author citation, valid publication, principle of priority and its limitations. Functions of Herbarium important herbaria and botanical gardens of the world and India. Documentation: Flora , keys: single access and multi-access.</p>	15
4	<p>Unit 4: Classification and Families: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker & Engler and Prantl classification. Sytematic study and economic importance of plants belonging to the following families: Polypetalae: Rutaceae and Caesalpinaceae Gamopetalae: Asteraceae, Asclepiadaceae. Monocotyledons: Poaceae.</p>	15

Examination and Evaluation Pattern :		
1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition. 2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition. 3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A. 4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.		

Course Title: Plant Ecology and Taxonomy Lab (III Semester)

Course Code : BSBT350CCP

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 2

Instruction Mode: Lecture

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives: Learn about Environment and Environmental factors, types of Ecosystems. Understand the basic techniques of analysis of soil samples and also in preparation of Herbarium.

Course Outcomes: Learn about the techniques of developing Herbarium. Students can able to differentiate root and stem parasites and understand about the morphological adaptations of hydrophytes and xerophytes.

Unit	Course Content	Instruction Hours
	<ol style="list-style-type: none">1. Study of instruments used to measure microclimatic variables : Soil thermometer, maximum and minimum temperature, anemometer, psychrometer/hygrometer, rain gauge and lux meter.2. Determination of pH, and analysis of two soil samples for carbonates, chorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.3. Study of morphological adaptations of hydrophytes and xerophytes (four each)4. Study of biotic interactions of the stem parasite (Cuscuta), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants).5. Study of vegetative and floral characters of the following families: Rutaceae ,Caesalpinaceae, Asteraceae, Asclepiadaceae and Poaceae6. Mounting of a properly dried and pressed specimen of plants belongs to above families on herbarium sheets.	60Hrs
Examination and Evaluation Pattern :		
Text Books and References :		

Course Title: Plant Physiology and Metabolism (Semester IV)

Course Code: BSBT401CCT

Scheme of Instruction

Total Duration : 60Hr

Periods /Week : 4

Credits : 4

Instruction Mode : Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation : 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: To understand the Physiological process in plants like anabolism, catabolism and metabolism and also metabolic activities in plants.

Course Outcomes: Learn about the various mechanisms in plants taking from transpiration to growth metabolism. Understand how the intermediate products of various mechanisms are linked to each other and also act as a precursor in developing some other products.

Unit	Course Content	Instruction Hours
1	Water Relations: Plant water relations, importance of water, water potential and its components. Transpiration and its significance, factors effecting transpiration, root pressure and Guttation. Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps	15
2	Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene);Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C3, C4and CAM pathways of carbon fixation; Photorespiration. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, Glyoxalate mechanism, Pentose Phosphate pathway.	15
3	Enzymes: Structure, properties and Mechanism of enzyme catalysis and enzyme inhibition Nitrogen Metabolism: Biological nitrogen fixation: nitrate and ammonia assimilation.	15
4	Plant growth regulators: discovery and physiological roles of - Auxins, Gibberellins, Cytokinins, ABA and ethylene. Physiology of flowering plants: Photoperiodism, role of phytochrome in Flowering.	15
Examination and Evaluation Pattern :		

Text Books and References :

1. Steward. F.C (1964): Plants at Work (A summary of Plant Physiology) Addison- Wesley Publishing Co., Inc. Reading, Massachusetts, Palo alto, London.
2. Devlin, R.M. (1969) : Plant Physiology, Holt, Rinehart & Winston & Affiliated East West Press (P) Ltd., New Delhi .
3. Noggle, R.& Fritz (1989):Introductory Plant Physiology Prentice Hall of India.
4. Lawlor.D.W. (1989): Photosynthesis, metabolism, Control & Physiology ELBS/Longmans-London.
5. Mayer, Anderson & Bonning(1965): Introduction to Plant Physiology D.Van Nostrand . Publishing Co., N.Y.
6. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.
7. Salisbury, F.B & C.W. Ross (1999): Plant Physiology CBS Publishers and Printers, New Delhi.
8. Plummer, D.(1989) Biochemistry–the Chemistry of life ,McGraw Hill Book Co., London, N.Y. New Delhi, Paris, Singapore, Tokyo.
9. Day, P.M.& Harborne, J.B. (Eds.,) (2000): Plant Biochemistry. . Harcourt Asia (P) Ltd., India & Academic Press, Singap

Course Title: Plant Physiology and Metabolism Lab (Semester IV)

Course Code: BSBT450CCP

Scheme of Instruction

Total Duration : 60 Hr
Periods /Week : 4
Credits : 2

Scheme of Examination

Maximum Score : 50
Internal Evaluation : 15
End Semester : 35

Instruction Mode : Lecture /Demonstration

Exam Duration : 3 Hrs

Course Objectives: To understand the Physiological processes in plants like osmosis, photosynthesis, respiration by use of physiological instruments.

Course Outcomes: Students expected to learn about procedure to observe the viability of seeds, determination of rate of transpiration and other physiological processes.

Unit	Course Content	Instruction Hours
	List of Experiments 1. Osmosis – by potato osmoscope experiment 2. Determination osmotic potential of cell sap by plasmolysis method. 3. Determination of rate of transpiration by using cobalt chloride method. 4. Calculation of stomatal index, frequency. 5. Determination of catalase activity using potato tubers by titration method. 6. Separation of chloroplast pigments using paper chromatography technique. 7. Testing of seed viability using 2,3,5 triphenyl tetrazolium chloride(TTC). 8. Determination of Transpiration rate by Ganongs Potometer.	60Hrs
Examination and Evaluation Pattern :		
Text Books and References :		

Course Title : Plant Genetics and Cell Biology (Semester V)

Course Code : BSBT501DST

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 4

Instruction Mode : Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation : 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: To learn about the various aspects of Plant Genetics.

To know the components and structure of plant and animal cell and its organelles.

Course Outcomes: Students able to understand Mendelism and laws of inheritance. Mutations and mutagenic factors and also the importance of semi autonomous nature of cell organelles.

Unit	Course Content	Instruction Hours
1	Mendelism and laws of Inheritance: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy and Polygenic Inheritance. Extrachromosomal Inheritance Chloroplast mutation: Variegation in Four o'clock plant	15
2	Linkage, crossing over, chromosome mapping and Sex Linkage. Variation in chromosome number and structure. Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy. Gene mutations, Types of mutations; Mutagens – physical and chemical (Base analogs, deaminating, alkylating and intercalating agents).	15
3	Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory). 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.	15
4	Nucleus and Nucleolus Structure and function. Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. Structural organization and Functions of Chloroplast, mitochondria and peroxisomes; Semiautonomous nature of mitochondria and chloroplast. Structure and Functions of Endoplasmic Reticulum (Smooth ER and Rough ER), Golgi apparatus and Lysosomes . Cell division: mitosis and meiosis, Cell Cycle.	15
Examination and Evaluation Pattern :		
Text Books and References :		
Text Books and References :		

1. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
2. De. Robertis and De Robertis, 1998, Cell and Moleceular Biology, K.M. Verghese and Company .
3. Sinnott, E.W., L.C. Dunn & J. Dobshansky (1958) : Principles of Genetics (5th Edition) McGraw Hill Publishing Co., N.Y. Toronto, London.
4. Winchester, A.M. (1958) : Genetics(3rd Edition) Oxford & IBH Publishing House, Calcutta, Bombay, New Delhi.
5. Singleton, R.(1963) : Elementary Genetics, D. Van Nostrand Co., Ltd., Inc., N.Y. & Affiliated East West Press (P) Ltd., New Delhi.
6. Strickberger, M.W. (1976): Genetics(2nd Edition) MacMillan Publishing Co., Inc., N.Y., London
7. Watson, J.D. (1977): Molecular Biology of the Gene, W.A. Benjamin, Inc., Menlo Park- California, Reading-Massachusetts, London, Amsterdam, Don Mills, Ontario, Sydney.
8. Gardner,E.J & Snusted, D.P.(1984): Principles of Genetics (7thedition) John Wiley & Sons, N.Y. Chichester, Brisbane, Toronto, Singapore.

Course Title : Plant Genetics and Cell Biology Lab (Semester V)

Course Code : **BSBT550DSP**

Scheme of Instruction

Total Duration : 60Hr

Periods /Week : 4

Credits : 2

Instruction Mode: Lecture /Demonstration

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives:

Course Outcomes:

Unit	Course Content	Instruction Hours
	List of Experiments 1. Mitosis and Meiosis through temporary squash preparation. 2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square. 3. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4). 5. Photographs/Permanent Slides showing Translocation Ring, Laggards and Inversion Bridge.	60Hrs
Examination and Evaluation Pattern :		
Text Books and References :		

Course Title: Economic Botany (Semester V)

Course Code: BSBT502DST

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 4

Instruction Mode : Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation : 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: To know the Economic importance of plants and also to study the morphology and useful parts of plants.

Course Outcomes: Learn about the different kinds of plants and their role in industries, Pharmaceuticals and also in preparation various kinds of products useful for human welfare.

Unit	Course Content	Instruction Hours
1	Origin of Cultivated Plants Concept of Centres of Origin, their importance. Cereals: Wheat and Rice (origin, morphology & uses) Millets : Jowar and Bajra (Origin,morphology & uses)	15
2	Legumes: Origin, morphology and uses of Chick pea, Pigeon pea and fodder legumes. Importance to man and ecosystem. Oils: groundnut, linseed, soyabean, mustard and coconut (Botanical name, family & uses). Essential Oils: General account & their uses.	15
3	Spices: Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove and black pepper Beverages : Tea, Coffee (morphology & uses)	15
4	Drug-yielding plants. Therapeutic and habit-forming drugs with special reference to <i>Cinchona</i> , <i>Digitalis</i> and Tobacco (Morphology, uses and health hazards). Timber plants: General account with special reference to teak and pine. Fibres : Classification of fibres; Cotton, Coir and Jute (morphology and uses).	15
Examination and Evaluation Pattern :		
Text Books and References :		
1.	India	Ashok Bendre and Ashok Kumar 1998-99 Economic Botany Rastogi Publications, Meerut,
2.		Edmondson A and D. Druce 1996 Advanced Biology Statistics Oxford University Press
3.	Cosec Meerut, India	Govinda Praksh and Sharma SK 1975 Introductory Economic Botany Jai Prakash Nath &
4.		Gupta, S.K. and Kaushik MP 1973 An Introduction to Economic Botany K. Nath & Co., Meerut, India
5.		Hill AW 1952 Economic Botany McGraw Hill Book Co., New York
6.		Jain SK 1981 Glimpses of Indian Ethnobotany Oxford & IBH, New Delhi
7.		Jain SK 1987 A Manual on Ethnobotany Scientific Publisher Jodhpur
		Jain SK and Mundgal 1999 Handbook of Ethnobotany London

- | | |
|-----|--|
| 8. | Mandal and Nambiar Agricultural Statistics, Agrobios Publications, Jodhpur |
| 9. | Palanichamy S and Manoharan M Statistical methods for Biologists, Palani Paramount publications, New Delhi |
| 10. | Pandey BP 2000 Economic Botany S. Chand & Co., New Delhi |
| 11. | Parihar P Biostatistics & Biometry, Agrobios Publications, Jodhpur |
| 12. | Ramakrishnan N. Fundamentals of Biostatistics, Sarao Publications, Naaagercoil |
| 13. | Sambamurthy, AVVS and Subrahmanyam, NS 1989 A Text Book of Economic Botany Wiley Eastern Ltd., New Delhi, |
| 14. | Sen. S 1992 Economic botany New Central Book Agency, Calcutta |
| 15. | Verma, V 1974 A Text Book of Economic Botany Emkay Publications, New Delhi |

Course Title : Economic Botany Lab (Semester V)

Course Code : **BSBT551DSP**

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 2

Instruction Mode : Lecture /Demonstration

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives:

Course Outcomes:

Unit	Course Content	Instruction Hours
	List of Experiments 1. Cereals: Wheat (habit sketch, L. S/T.S. grain, starch grains, micro-chemical tests) Rice (Habit sketch, study of paddy and grain, starch grains, micro-chemical	

	<p>tests).</p> <p>2. Legumes: Soybean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).</p> <p>3. Sources of sugars and starches: Sugarcane (habit sketch; cane juice-micro-chemical tests),</p> <p>4. Spices: Black pepper, Fennel and Clove (habit and sections).</p> <p>5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).</p> <p>6. Sources of oils and fats: Coconut- T.S. nut, Mustard-plant specimen, seeds; tests for fats in crushed seeds.</p> <p>7. Essential oil-yielding plants: Habit sketch of Rosa, Vetiveria, Santalum and Eucalyptus (specimens/photographs).</p> <p>8. Rubber: specimen, photograph/model of tapping, samples of rubber products.</p> <p>9. Drug-yielding plants: Specimens of Digitalis, Papaver and Cannabis.</p> <p>10. Tobacco: specimen and products of Tobacco.</p> <p>11. Woods: Tectona, Pinus: Specimen, Section of young stem.</p> <p>12. Fiber-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fiber and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fiber).</p>	<p>60Hrs</p>
<p>Examination and Evaluation Pattern :</p>		
<p>Text Books and References :</p>		

Course Title : Phytopathology (Semester VI)

Course Code : BSBT602DST

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 4

Instruction Mode : Lecture

Scheme of Examination

Maximum Score : 100

Internal Evaluation : 30

End Semester : 70

Exam Duration : 3 Hrs

Course Objectives: To acquire information about the different types of plant diseases.

To understand the classification of plant pathogens, diseases and control measures.

Course Outcomes: Learn about the different kinds of pathogens and their role in developing symptoms and diseases. Measures to control plant diseases.

Unit	Course Content	Instruction Hours
1	Introduction & Plant pathogens: History of Plant Pathology, Classification of Plant Diseases. Some important plant pathogens like Fung, Bacteria, Phytoplasmas, Spiroplasmas, Viruses, Viroids, Algae, protozoa and Phanergamic parasites with examples of diseased caused by them. Transmission of plant viruses, symptoms caused by Plant Viruses.	15

2	<p>Pathogenesis, Enzymes and Defence mechanism: Penetration and entry of plant pathogens and its development inside host tissue. Role of Enzymes, Growth regulators and Toxins in pathogenesis. Host-Parasite interaction and defence Mechanism (histological, physiological and biochemical) Defence mechanism in plants-Structural and Biochemical.</p>	15
3	<p>Plant Diseases: Plant Diseases: Terms and concepts; General symptoms; Geographical distribution of diseases; Etiology Bacterial diseases – Citrus canker and angular leaf spot of cotton. Viral diseases – Tobacco Mosaic viruses, vein clearing. Fungal diseases – Early blight of potato, Black stem rust of wheat, White rust of crucifers Mycoplasmal diseases: sandal spike, Grassy shoots disease of sugarcane.</p>	15
4	<p>Plant Diseases and Management: General principles of plant diseases management-importance , general principles-Avoidance, exclusion, eradication, protection and therapy, immunization. Regulatory methods-Plant Quarantine and inspection. Cultural methods-Rouging, eradication of alternate and collateral host, crop rotation, manure and fertilizer management, mixed cropping, sanitation etc.,</p>	15
Examination and Evaluation Pattern :		
Text Books and References :		

Course Title : Phytopathology Lab (Semester VI)
Course Code : BSBT651DSP

Scheme of Instruction

Total Duration : 60 Hr

Periods /Week : 4

Credits : 2

Instruction Mode : Lecture/Demonstration

Scheme of Examination

Maximum Score : 50

Internal Evaluation : 15

End Semester : 35

Exam Duration : 3 Hrs

Course Objectives: To understand the bacterial, viral fungal diseases and their symptoms and causal organism.

Course Outcomes: Learn about the identification diseases on the basis of symptoms and also techniques for isolation of Bacteria and fungi from the soil.

Unit	Course Content	Instruction Hours
	<p>List of Experiments</p> <p>1. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Angular leaf spot of cotton, Viral diseases: TMV, Vein clearing, And Fungal diseases: Early blight of potato, Black stems rust of wheat and White rust of crucifers.</p> <p>2. Microscopic observation Of Fungal disease Slides like <i>Puccinia</i></p>	

	<p>(Wheat Rust) <i>Alternaria</i>, <i>Albugo</i> (White Rust) <i>Phytophthora infestance</i> (Late Blight of Potato)</p> <p>3.Isolation and Enumeration of Bacteria from soil. 4.Isolation and Enumeration of Fungi From soil. 5.Anatomical Studies on leaves infected with Fungal Pathogens like Tikka disease of Ground nut. 6.Effect of Fungicides on Fungal spore Germination.</p>	60Hrs
Examination and Evaluation Pattern :		
Text Books and References :		