

**Course Title : Microbial Diversity Algae & Fungi (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:

Course Outcomes:

Unit	Course Content	Instruction Hours
1	Diversity of microbes-Viruses and Bacteria  Origin and evolution of life an outline Viruses Structure, replication and transmission; plant disease symptoms caused by viruses. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of Plant disease symptoms of crop plants caused by bacteria.	15
2	Diversity of microbes-Cyanobacteria  Brief account of Archaeobacteria, Chlamydia, Actinomycetes and Mycoplasma Cyanobacteria : Cell structure and thallus organization Structure and life history of <i>Oscillatoria</i> and <i>Nostoc</i> .	15
3	Algae: Algae: General account, thallus organization, structure, reproduction, classification. Structure, reproduction, life history and systematic position of Oedogonium, Chara, and Polysiphonia. Economic importance.	15
4	Fungi and Lichens:  Fungi general characters, classification, and economic importance. Structure, reproduction and life history of Saccharomyces, Penicillium, Puccinia, Alternaria. Lichens: Structure, reproduction; ecological and economic importance.	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 <sup>th</sup> 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 <sup>th</sup> edition, TataMc Graw Hi8ll Co, New Delhi.	

**Course Title : Microbial Diversity Algae & Fungi 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:

Course Outcomes:

Unit	Course Content	Instruction Hours
	<p>List of Experiments:</p> <ol style="list-style-type: none"><li>1. Equipment and methods used in Microbiology lab : Sprit lamp, Inoculation loop, Hot air oven, Autoclave, Laminar air flow and Incubator.</li><li>2. Preparation of solid and liquid media for culturing of microbes (Demonstration only)</li><li>3. Study of viruses and bacteria using electron micrographs (photographs).</li><li>4. Gram staining of Bacteria.</li><li>5. Study of plant diseases caused by viruses and bacteria: <b>Viruses:</b> Tobacco mosoic virus, Bendi vein clearing, Bunchy top of banana, Leaf curl of papaya. <b>Bacteria:</b> Angular leaf spot of cotton, Citrus canker, Leaf blight of paddy.</li><li>6. Vegetative and reproductive structures of the following taxa : <b>Algae:</b> <i>Oscillatoria</i>, <i>Nostoc</i>, <i>Chara</i>, <i>Oedogonium</i>, and <i>Polysiphonia</i>. <b>Fungi:</b> <i>Saccharomyces</i>, <i>Penicillium</i>, <i>Puccinia</i> and <i>Alternaria</i>.</li><li>7. Section cutting of the following fungal disease material and identification of pathogens: <i>Puccina</i>, and <i>Alternaria</i>.</li></ol> <p><b>Lichens:</b> Different types of thalli and their external morphology.</p>	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 <sup>th</sup> 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 <sup>th</sup> edition, TataMc Graw Hi8ll Co, New Delhi.	

**Course Title : Bryophytes, Pteridophytes and Gymnosperms (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:

Course Outcomes:

Unit	Course Content	Instruction Hours
1	Bryophyta:  General characters, classification and economic importance. Structure, reproduction, life history and systematic position of <i>Marchantia</i> , <i>Anthoceros</i> . Evolution of Sporophyte in Bryophyta.	15
2	Pteridophyta :  Pteridophyta : General characters, classification (Sporne) (3h) Structure, reproduction, life history and systematic position of <i>Lycopodium</i> , and <i>Marsilea</i> Evolution of stele in Pteridophytes.	15
3	Gymnosperms.  Gymnosperms : General characters, classification. (Panth & Sporne) Morphology of vegetative and reproductive parts, systemic position, life history of <i>Pinus</i> and <i>Gnetum</i> Economic importance of Gymnosperms.	15
4	Palaeobotany:  Palaeobotany: Introduction, fossils and fossilization ; Geological time scale. Fossil Bryophytes. Fossil Pteridophytes-Rhynia. Bennettitales: General characters.	15

Examination and Evaluation Pattern :

Text Books and References :

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 Text book of Pteridophyta Mac Millan India ltd. Delhi	
7	Vashista PC Botany for Degree students-Gymnosperms , 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 Essentials of Palaeobotany, Vikas Publishing House, New Delhi.	

**Course Title : Bryophytes, Pteridophytes and Gymnosperms 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:

Course Outcomes:

Unit	Course Content	Instruction Hours
	<p>Morphology and anatomy of the following taxa:</p> <p><b>1. Bryophyta:</b> <b><i>Marchantia</i></b>: External morphology of thallus, Anatomy of thallus, Gemma cup, Archegoniophore, Antheridiophore and Sporophyte. <b><i>Anthoceros</i></b>: External morphology of thallus, Anatomy of thallus, Archegoniophore, Antheridiophore and Sporophyte.</p> <p><b>2. Pteridophyta :</b> <b><i>Lycopodium</i></b>: External morphology of Sporophyte, Anatomy of stem, Leaf, Root, Strobilus. <b><i>Marsilea</i></b>: External morphology of Sporophyte, Anatomy of rhizome, petiole and sporocarp.</p> <p><b>3. Gymnosperms :</b> <b><i>Pinus</i></b>: External morphology, T.S of Needle and Stem, reproductive structures. (Male and female cones) <b><i>Gnetum</i></b>: External morphology, T.S of Stem, reproductive structures. (male and female cones)</p> <p><b>4. Fossil forms:</b> Permanent slides / photographs of Rhynia and Cycadeoidia</p>	60Hrs

Examination and Evaluation Pattern :

Text Books and References :

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 Text book of Pteridophyta Mac Millan India ltd. Delhi	
7	Vashista PC Botany for Degree students-Gymnosperms , 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 Essentials of Palaeobotany, Vikas Publishing House, New Delhi.	



**Course Title:** Taxonomy, Angiospermic families, Biodiversity and Medicinal Botany (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:

Course Outcomes:

Unit	Course Content	Instruction Hours
1	Principles of Taxonomy Introduction: Principles of plant systematics and taxonomy, types of classification: Artificial, Natural and Phylogenetic. Systems of classification: Salient features and comparative account of Bentham & Hooker, Engler & Prantle. Nomenclature and Taxonomic resources: An introduction to ICBN, Vienna code. Herbarium: Concept, techniques and applications.	15
2	Angiospermic families and pollination mechanism Systematic study and economic importance of plants belonging to the following families: <b>Polypetalae:</b> Annonaceae, Rutaceae, Caesalpinaceae, Mimosaceae, <b>Gamopetalae:</b> Asteraceae, Asclepiadaceae, <b>Monochlamydae:</b> Euphorbiaceae, <b>Monocotyledons:</b> Poaceae. Pollination mechanism of the following families. Fabaceae, Asclepiadaceae,	15
3	Biodiversity and Conservation Biodiversity: Concept, Conservation on biodiversity, Earth summit. Types of biodiversity. Levels, threats and <b>values of biodiversity.</b> IUCN threat categories, RED data book. Role of organizations in the	15

	conservation of biodiversity -IUCN, UNEP,WWF, NBPGR.	
4	Ethonomedicine: Scope, interdisciplinary nature, distinction of ethno medicine from folklore medicine. Outlines of Ayurveda, Siddha,Unani and Homeopathic systems of traditional medicine. The role of AYUSH, NMPB, CIMAP and CDRI. Plants in primary health care: Common medicinal plants - <i>Tinospora cordifolia</i> , <i>Ocimum sanctum</i> , <i>Piper longum</i> , <i>Terminalia chebula</i> , <i>Aloe vera</i> , <i>Curcuma longa</i> .	15
Examination and Evaluation Pattern :		
Text Books and References : 1. Porter, C.L. ( ): Taxonomy of flowering Plants, Eurasia Publishing House, New Delhi. 2. Lawrence, G.H.M. (1953): Taxonomy of Vascular Plants, Oxford & IBH Publishers, New Delhi, Calcutta. 3. Jefferey, C.(1968) : An Introduction to Plant Taxonomy J.A. Churchill, London. 4. Mathur, R.C.(1970) : Systematic Botany (Angiosperms) Agra Book Stores- Lucknow, Ajmer, Allahabad, Delhi.		

**Course Title:** Principles of taxonomy, Angiospermic families, Biodiversity and Medicinal Botany Lab(Semester III)

**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:

Course Outcomes:

Unit	Course Content	Instruction Hours
	Demonstration of herbarium techniques-preparations and submission of herbariums specimens (Minimum 25).	60Hrs
II.	Systematic study of locally available plants belonging to the following families. 1. <b>Polypetalae:</b> Annonaceae, Rutaceae, Caesalpinaceae, Mimosaceae. 2. <b>Gamopetalae:</b> Asteraceae, Asclepiadaceae. 3. <b>Monochlamydae:</b> Euphorbiaceae. 4. <b>Monocotyledons:</b> Poaceae.	
.III.	Study of Common medicinal plants - <i>Tinospora cordifolia</i> , <i>Ocimum sanctum</i> , <i>Piper longum</i> , <i>Terminalia chebula</i> , <i>Aloe vera</i> , <i>Curcuma longa</i> .	
V.	Field trip.	

Examination and Evaluation Pattern :

Text Books and References :

**Course Title:** Plant Anatomy and Embryology (Semester IV)

**Course Code:** BSBT401CCT

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:

Course Outcomes:

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 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 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 IV)

**Course Code:** BSBT450CCP

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
	<b>List of Experiments</b>	
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 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:

Course Outcomes:

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;	15

	Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis.	
4	<p>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 .</p> <p>Cell division: mitosis and meiosis, Cell Cycle.</p>	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
	<b>List of Experiments</b> 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:

Course Outcomes:

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	15

	Beverages : Tea, Coffee (morphology & uses)	
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 :		

**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
	<p><b>List of Experiments</b></p> <ol style="list-style-type: none"> <li>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 tests).</li> <li>2. Legumes: Soybean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).</li> <li>3. Sources of sugars and starches: Sugarcane (habit sketch; cane juice-micro-chemical tests),</li> <li>4. Spices: Black pepper, Fennel and Clove (habit and sections).</li> <li>5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).</li> <li>6. Sources of oils and fats: Coconut- T.S. nut, Mustard-plant specimen, seeds; tests for fats in crushed seeds.</li> </ol>	

	<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>	60Hrs
Examination and Evaluation Pattern :		
Text Books and References :		

**Course Title:** Plant Physiology and Seed Technology (Semester VI)

**Course Code:** BSBT601DST

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:

Course Outcomes:

Unit	Course Content	Instruction Hours
1	Physiology-I Water Relations: Plant water relations, importance of water, water potential and its components. Transpiration and its significance, factors effecting transpiration, root pressure and Guttation. Enzymes: Structure, properties and Mechanism of enzyme catalysis and enzyme inhibition.	15
2	Physiology-II 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. Translocation of organic substances: Mechanism of phloem transport; source-sink Relationships. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron	15

	transport system, mechanism of oxidative phosphorylation.	
3	<p>Physiology-III</p> <p>Nitrogen Metabolism: Biological nitrogen fixation: nitrate and ammonia assimilation.</p> <p>Plant growth regulators: discovery and physiological roles of - Auxins, Gibberellins, Cytokinins, ABA and ethylene.</p> <p>Physiology of flowering plants: Photo periodism, role of phytochrome in Flowering.</p>	15
4	<p>Seed technology IV:</p> <p>Seed structure and types.</p> <p>Seed dormancy-causes and methods.</p> <p>Seed storage- seed bank, factors effecting seed storage and seed viability.</p>	15
Examination and Evaluation Pattern :		
Text Books and References :		
<ol style="list-style-type: none"> <li>1. Steward. F.C (1964): Plants at Work (A summary of Plant Physiology) Addison- Wesley Publishing Co., Inc. Reading, Massachusetts, Palo alto, London.</li> <li>2. Devlin, R.M. (1969) : Plant Physiology, Holt, Rinehart &amp; Winston &amp; Affiliated East West Press (P) Ltd., New Delhi .</li> <li>3. Noggle, R.&amp; Fritz (1989):Introductory Plant Physiology Prentice Hall of India.</li> <li>4. Lawlor.D.W. (1989): Photosynthesis, metabolism, Control &amp; Physiology ELBS/Longmans- London.</li> <li>5. Mayer, Anderson &amp; Bonning(1965): Introduction to Plant Physiology D.Van Nostrand . Publishing Co., N.Y.</li> <li>6. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.</li> <li>7. Salisbury, F.B &amp; C.W. Ross (1999): Plant Physiology CBS Publishers and Printers, New Delhi.</li> <li>8. Plummer, D.(1989) Biochemistry–the Chemistry of life ,McGraw Hill Book Co., London, N.Y. New Delhi, Paris, Singapore, Tokyo.</li> <li>9. Day, P.M.&amp; Harborne, J.B. (Eds.,) (2000): Plant Biochemistry. . Harcourt Asia (P) Ltd., India &amp; Academic Press, Singap</li> </ol>		

**Course Title:** Plant Physiology and Seed Technology Lab ( Semester VI)  
**Course Code:** BSBT650DSP

**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
	<p><b>List of Experiments</b></p> <ol style="list-style-type: none"> <li>1. Osmosis – by potato osmoscope experiment</li> <li>2. Determination osmotic potential of cell sap by plasmolysis method.</li> <li>3. Determination of rate of transpiration by using cobalt chloride method.</li> <li>4. Calculation of stomatal index, frequency.</li> <li>5. Determination of catalase activity using potato tubers by titration method.</li> <li>6. Separation of chloroplast pigments using paper chromatography technique.</li> <li>7. Testing of seed viability using 2,3,5 triphenyl tetrazolium chloride(TTC).</li> <li>8. Determination of Transpiration rate by Ganongs Potometer.</li> </ol>	60Hrs

Examination and Evaluation Pattern :

Text Books and References :

**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:

Course Outcomes:

Unit	Course Content	Instruction Hours
1	History of Plant Pathology, Classification of Plant Diseases., General Characteristics of viruses, morphology, composition of viral protein and nucleic acids. Transmission of plant viruses, symptoms caused by Plant Viruses. General characters and classification of Plant Pathogenic Bacteria, Symptoms caused by Pathogenic Bacteria.	15
2	Role of Enzymes, Growth regulators and Toxins in pathogenesis. Host-Parasite interaction and defence Mechanism (histological, physiological and biochemical) Symptomology: Effect of Infection on the Physiology of the host (Photosynthesis, Translocation, Respiration, Membrane Permeability, Transcription and Translation)	15



	.	
3	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	15
4	Study the Principles of Plant Disease Control: Plant Quarantine, Seed treatment, cultural methods, Chemical methods for Plant Disease control, breeding for Disease Resistant Varieties.	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 :

Course Outcomes :

Unit	Course Content	Instruction Hours
	<p><b>List of Experiments</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>2. Microscopic observation Of Fungal disease Slides like <i>Puccinia</i> (Wheat Rust) <i>Alternaria</i>, <i>Albugo</i> (White Rust) <i>Phytophthora infestance</i> (Late Blight of Potato)</li> <li>3. Isolation and Enumeration of Bacteria from soil.</li> <li>4. Isolation and Enumeration of Fungi From soil.</li> <li>5. Anatomical Studies on leaves infected with Fungal Pathogens like Tikka disease of Ground nut.</li> <li>6. Effect of Fungicides on Fungal spore Germination.</li> </ol>	<p>60Hrs</p>

Examination and Evaluation Pattern :		
Text Books and References :		