TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 - 2021

Botany (Hon.); Semester: 1ST; Paper: HC- 1016; - Outline

Department:	BOTANY	Semester	FIRST
Course:	HONOURS	Paper No:	HC-1016 (Theory)
Credit:	Theory - 04 Practical -02	Lecture	60

BOTANY (Hon.); Semester: 1ST; Paper: HC- 1016; 1.1: Theory – Detailed

Paper: HC- 1016; 1.1 THEORY (*Phycology and Microbiology*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Introduction to microbial world:** Scope of microbes in industry and environment; Microbial nutrition, growth and metabolism	Dr. Kamal Choudhury	04	August
2	**Viruses:** Discovery, physiochemical and biological characteristics; classification, general structure - viroids and prions; replication, T-phage, TMV. Economic importance of viruses	Dr. Kamal Choudhury	06	Aug -Sept
3	**Bacteria:** Discovery, general account; Types- archaebacteria, eubacteria, actinomycetes, mycoplasma, rickettsia, chlamydiae and sphaeroplasts; Cell structure; Nutritional types; Reproduction,. Economic importance.	Dr. Kamal Choudhury	06	September
4	**Algae:** General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food, flagella; methods of reproduction; Classification – Fritsch, Lee; Role of algae in the environment, agriculture, biotechnology and industry, Economic importance of Diatoms	Miss Kasturi Talukdar	08	August
5	**Cyanophyta and Xanthophyta:** Ecology and occurrence; Range of thallus organization; Cell structure; Reproduction, Morphology and life-cycle of Nostoc and *Vaucheria*.	Miss Kasturi Talukdar	04	Sept. –Oct.

6	**Chlorophyta, Charophyta & Bacillariophyta** General characteristics; Occurrence; Range of thallus organization; Cell structure; Reproduction. Morphology and life-cycles of Volvox, Oedogonium, Coleochaete, Chara. General Account of Bacillariophyta., Agaricus, Cercospora, Colletotrichum	Miss Kasturi Talukdar	06	Aug. –Sept.
7	**Phaeophyta and Rhodophyta:** Characteristics; Occurrence; Range of thallus organization; Cell structure; Reproduction. Morphology and life-cycles of Ectocarpus, Fucus and Polysiphonia.	Dr. Kamal Choudhury	06	October

BOTANY (Hon.); Semester: 1ST; Paper: HC- 1016; 1.2**: Practical -** Detailed

Paper: HC- 1016; 1.2 - PRACTICAL (*Phycology and Microbiology*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Microbiology:** Electron micrographs/Models of viruses – T-Phage and TMV/ Line drawings/ Photographs of Lytic and Lysogenic Cycle.	Dr. Kamal Choudhury	02	August
2	**Microbiology:** Types of Bacteria to be observed from temporary/permanent Slides/ photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.	Dr. Kamal Choudhury	04	August
3	**Microbiology:** Gram staining.	Dr. Kamal Choudhury	02	August
4	**Microbiology:** Isolation of soil microflora.	Dr. Kamal Choudhury	04	September
5	**Microbiology:** Endospore staining with malachite green using the (endospores taken from soil bacteria).	Dr. Kamal Choudhury	04	September
6	**Phycology:** Study of vegetative and reproductive structures of *Nostoc*, *Volvox*, *Oedogonium*, *Chara*,*Vaucheria*, *Ectocarpus*, *Fucus* and *Polysiphonia*,*Procholoron* through electron micrographs/ permanent slides.	Miss Kasturi Talukdar	06	August

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 - 2021

Botany (Hon.); Semester**: 1ST; Paper: HC- 1026; -** Outline

Department:	BOTANY	Semester	FIRST
Course:	HONOURS	Paper No:	HC-1016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 1ST; Paper: HC- 1026;** 2.1: **Theory – Detailed**

Paper: HC- 1026 - 2.1 - THEORY (*Biomolecules and Cell Biology)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Biomolecules:** Types and significance of chemical bonds; Structure and properties of water; pH and buffers**.** **Carbohydrates:** Mono and Disaccharides; Oligosaccharides and polysaccharides. **Lipids:** Definition and major classes of storage and structural lipids **Proteins:** Structure of amino acids; Levels of protein structure-primary, secondary, tertiary and quarternary; **Neuclic acid:** Structure, Types of nucleic acids; Structure of A, B, C, D, Z types of DNA; Types of RNA.	Dr. Chunamoni Das	12	August
2I	**Bioenergenetics:** Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule.	Dr. Chunamoni Das	04	September
3	**Enzymes:** Structure: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification; Mechanism of action Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.	Miss Kasturi Talukdar	06	September
4	**The cell:** Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell.	Dr. Chunamoni Das	04	Sept. -Oct

5	**Cell wall and plasma membrane**: Chemistry, structure and function. membrane function; fluid mosaic model; Membrane, endocytosis and exocytosis.	Dr. Chunamoni Das	04	October
6	**Cell organelles**: Nucleus; Cytoskeleton; Chloroplast; Mitochondria and Peroxisomes. Endomembrane systems: Endoplasmic Reticulum, Golgi Apparatus, Lysosome.	Dr. Nandini Kakoti	08	Sept. –Oct
7	**Cell division:** Phases of eukaryotic cell cycle, mitosis and meiosis; Regulation of cell cycle-checkpoints, role of protein kinases.	Dr. Chunamoni Das	06	Oct. –Nov.

BOTANY (Hon.); Semester: 1ST; Paper: HC- 1026; 2.2**: Practical -** Detailed

Paper: HC- 1026; 2.2 - PRACTICAL (*Biomolecules and Cell Biology*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.	Dr. Chunamoni Das	04	August
2	Study of plant cell structure with the help of epidermal peel mount of Onion/*Rhoeo/Crinum*.	Dr. Chunamoni Das	02	August
3	Demonstration of the phenomenon of protoplasmic streaming in *Hydrilla* and *Vallisnaria* leaf.	Dr. Chunamoni Das	02	August
4	Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).	Dr. Chunamoni Das	02	September
5	Cytochemical staining of : DNA- Feulgen and cell wall in the epidermal peel of onion using Periodic Schiff's (PAS) staining technique.	Miss Kasturi Talukdar	04	September
6	Study the phenomenon of plasmolysis and deplasmolysis.	Miss Kasturi Talukdar	02	August
7	Study different stages of mitosis and meiosis (Demostration).	Miss Kasturi Talukdar	02	August

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 -2021

Botany (Hon.); Semester**: 1st; Paper: HG-RC- 1016; -** Outline

Department:	BOTANY	Semester	FIRST
Course:	REGULAR	Paper No:	HG-RC-1016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

BOTANY (Gen.); Semester: 1ST; Paper**: HG-RC- 1016;** 1.1**: Theory –** Detailed

Paper: HC- 1016; 1.1 THEORY (*Biodiversity –Microbes, Algae Fungi and Archegoniate*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Microbes:** **Viruses** – Discovery, structure, replication, DNA virus, RNA virus, Lytic and lysogenic cycle, Economic importance. **Bacteria** –General accont and cell structure; Reproduction, Economic importance.	Dr. Kamal Choudhury	08	August
2	**Algae:** General account; Range of thallus structure and reproduction; Classification; Morphology and life-cycles of Nostoc, Chlamydomonas, Oedogonium, Vaucheria, Fucus, Polysiphonia. Economic importance	Miss Kasturi Talukdar	08	August
3	**Fungi:** Introduction- General characteristics, ecology, range of thallus organization, cell wall composition, nutrition, reproduction and classification. Ecology & life cycle of Rhizopus, Penicillium, Alternaria, Puccinia, Agaricus; Symbiotic Associations- **Lichens:** General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and endomycorrhiza and their significance	Miss Kasturi Talukdar	08	Aug -Sept
4	**Archegoniate:** Unifying characters**,** Transition to land habit, Alternation of generations	Dr. Kamal Choudhury	03	Aug -Sept
5	**Bryophytes:** General account, Classification, Range of thallus organization, morphology and reproduction of Marchantia and Funaria. Economic importance with special reference to Sphagnum	Dr. Chunamoni Das	08	August.

6	**Pteridophytes:** General account, classification, Early land plantv(Cppksonia and Rhynia). Morphology and reproduction of Selaginella, Equisetum and Pteris. Heterospory & Seed Habit. Ecological and Economic importance.	Dr. Kamal Choudhury	08	Sept. -Oct
7	**Gymnosperms:** General characteristics, classification. Classification morphology, and reproduction of Cycas and Pinus. Ecological and economical importance.	Dr. Chunamoni Das	06	Aug- Sept

BOTANY (Hon.); Semester: 1ST; Paper: HG-RC: 1016; 1.2**: Practical -** Detailed

Paper: HG-RC: 1016; 1.2 - PRACTICAL (*Biodiversity –Microbes, Algae Fungi and Archegoniate*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Microbes:** 1. T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle. 2 Types of Bacteria from temporary/permanent slides/photographs; Binary Fission; Conjugation; Structure of root nodule. 3 Gram staining	Dr. Kamal Choudhury	03	Septembert
2	**Algae:** Study of vegetative and reproductive structures of Nostoc, Chlamydomonas Oedogonium, Vaucheria, Fucus and Polysiphonia	Dr. Nandini Kakoti	04	August
3	**Fungi:** **i)** Rhizopus and Penicillium: ii) Puccinia iii) *Agaricus*	Dr. Nandini Kakoti	04	September
4	**Licchens:** Crustose and Foliose **Michorrhiza:** Endo and ecto micorrhizae	Dr. Kamal Choudhury	02	September
5	**Bryophytes:** Marchantia and Funaria	Dr. Chunamoni Das	02	September
6	**Pteridophytes:** Selaginella, Equisetum, Pteris.	Dr. Chunamoni Das	03	Sept -Oct
7	**Gymnosperms:** Cycas, Pinus	Dr. Chunamoni Das	02	October

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 -2021

Botany (Hon.); Semester**: 3RD; Paper: HC- 3016; -** Outline

Department:	BOTANY	Semester	THIRD
Course:	HONOURS	Paper No:	HC-1016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 3RD; Paper: HC- 3016; 5**.1: **Theory –** Detailed

Paper: HC- 3016 - 5.1 - THEORY
(*Morphology and Anatomy of Angiosperms)*

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Morphology:** Morphology of inflorescence, stamens and carpel, fruit; Telome theory, phyllode theory; Role of morphology in plant classification.	Miss Kasturi Talukdar	04	August
2I	**Introduction and scope of plant Anatomy:** Application in systematics, forensics and pharmacognosy	Miss Kasturi Talukdar	04	August
3	**Structure and Development of Plant Body:** Internal organization of plant body: The three tissue systems, types of cells and tissues. Development of plant body: Polarity, Cytodifferentiation and organogenesis during embryogenic development..	Miss Kasturi Talukdar	06	Aug. Sept.
4	***Tissues:*** Classification of tissues; Simple and complex tissues; cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. Hydathodes, cavities, lithocysts and laticifers.	Miss Kasturi Talukdar	06	September
5	**Apical Meristems:** Evolutionary concept of organization of shoot apex, Types of vascular bundles; Structure dicot & monocot stem, leaves. Organization of root apex; Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis, origin of lateral root.	Miss Kasturi Talukdar	08	Sept. –Oct.

6	**Vascular Cambium and Wood:** Structure, function of cambium; Secondary growth in root and stem. Axially and radially oriented elements; Types of rays and axial parenchyma; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses;.	Miss Kasturi Talukdar	08	Sept. –Oct
7	**Adaptive and Protective Systems:** Epidermal tissue system, cuticle, epicuticular waxes, trichomes, stomata; Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes.	Miss Kasturi Talukdar	04	Oct. –Nov.

Botany (Hon.); Semester**: 3RD; Paper: HC- 3016; 5**.2: **Practical -** Detailed

Paper: HC- 3016; 5.2 - PRACTICAL (*Morphology and Anatomy of Angiosperms*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Study of special types of inflorescence – Cyathium, Hypanthodium, Verticillaster, Hypanthium.	Miss Kasturi Talukdar	02	August
2	Study of special types of fruits- Superior fruits (*Dillenia*); Aggregate fruits (Custard apple, *Michelia*, Periwinkles, *Polyalthia*); Multiple fruits (Pine apple, Jack fruits).	Miss Kasturi Talukdar	02	August
3	Study of anatomical details through permanent slides/temporary stain mounts / macerations / museum specimens with the help of suitable examples.	Miss Kasturi Talukdar	02	August
4	Apical meristem of root, shoot and vascular cambium.	Miss Kasturi Talukdar	02	September
5	Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.	Miss Kasturi Talukdar	02	September
6	. Root: monocot, dicot, secondary growth..	Miss Kasturi Talukdar	02	September
7	Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.	Miss Kasturi Talukdar	02	October
8	Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).	Miss Kasturi Talukdar	02	October
9	Adaptive Anatomy: xerophytes, hydrophytes.	Miss Kasturi Talukdar	02	November
10	Secretory tissues: cavities, lithocysts and laticifers	Miss Kasturi Talukdar	02	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 -2021

Botany (Hon.); Semester**: 3RD; Paper: HC- 3026; -** Outline

Department:	BOTANY	Semester	THIRD
Course:		Paper No:	HC-1016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 3RD; Paper: HC- 3026; 6.1**: **Theory –** Detailed

Paper: HC- 3026 - 6.1 - THEORY
(*Economic Botany)*

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Origin of Cultivated Plants:** Centres of Origin, their importance with reference to Vavilov's work. Introductions, domestication and loss of crop genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.	Dr. Kamal Choudhury	04	August
2	**Cereals:** Wheat and Rice (origin, morphology, processing & uses); Brief account of millets.	Dr. Kamal Choudhury	04	August
3	**Legumes:** Origin, morphology and uses of Chick pea, Pigeon pea and fodder legumes. Importance to man and ecosystem.	Dr. Kamal Choudhury	04	August
4	**Sources of sugars and starches:** Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato – morphology, propagation & uses.	Dr. Kamal Choudhury	04	Aug. Sept.
5	**Spices:** Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove and black pepper.	Dr. Kamal Choudhury	04	September
6	**Beverages:** Tea, Coffee (morphology, processing & uses).	Dr. Kamal Choudhury	03	September
7	**Sources of oils and fats:** Description, classification, extraction, their uses and health implications groundnut, coconut, linseed, soybean, mustard and coconut. Essential Oils: Extraction methods, comparison, their uses.	Dr. Kamal Choudhury	04	September
8	**Natural Rubber:** Para-rubber: tapping, processing and uses.	Dr. Kamal Choudhury	03	Sept. –Oct

9	**Drug-yielding plants:** Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis; Tobacco (Morphology, processing, uses and health hazards).	Dr. Kamal Choudhury	04	October
10	**Timber plants*:*** General account with special reference to teak and pine.	Dr. Kamal Choudhury	03	October
11	***Fibers:*** Classification based on the origin of fibers; Cotton, Coir and Jute (morphology, extraction and uses).	Dr. Kamal Choudhury	03	Oct – Nov.

Botany (Hon.); Semester**: 3RD; Paper: HC- 3026; 6**.2: **Practical -** Detailed

Paper: HC- 3026; 6.2 - PRACTICAL (*Economic Botany*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Cereals**: Study of useful parts: Rice/Bean (habit sketch, study of paddy and grain, starch grain, micro-chemical test).	Dr. Kamal Choudhury	02	August
2	**Legumes**: Bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).	Dr. Kamal Choudhury	02	August
3	**Beverages**: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).	Dr. Kamal Choudhury	02	August
4	Sources of oils and fats: Coconut and Mustard.	Dr. Kamal Choudhury	02	September
5	**Rubber**: Specimen, photograph/model of tapping, samples of rubber products.	Dr. Kamal Choudhury	02	September
6	**Test for alkaloids:** Neem, *Vinca rosea*.	Dr. Kamal Choudhury	02	September
7	**Fiber-yielding plants**: Cotton, Jute (specimen, transverse section of stem, test for lignin).	Dr. Kamal Choudhury	02	October

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 -2021

Botany (Hon.); Semester**: 3RD; Paper: HC- 3036; -** Outline

Department:	BOTANY	Semester	THIRD
Course:	HONOURS	Paper No:	HC-3036 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 3RD; Paper: HC- 3036; 7**.1: **Theory –** Detailed

Paper: HC- 3036 - 7.1 - THEORY
(Genetics)

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Mendelian genetics and its extension:** Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance.	Dr. Chunamoni Das	16	August
2	**Extrachromosomal Inheritance:** Chloroplast inheritance: Variegation in Four o'clock plant; Mitochondrial in yeast; Maternal effects-shell coiling in snail; Kappa particles in Paramecium.	Dr. Chunamoni Das	06	Aug - Sept
3	**Linkage, crossing over and chromosome mapping:** Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage.	Dr. Chunamoni Das	08	September
4	**Variation in chromosome number and structure:** Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy	Dr. Chunamoni Das	06	Sept. –Oct
5	**Gene mutations:** Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical; Detection of mutations: ClB method. Role of Transposons in mutation. DNA repair mechanisms.	Dr. Chunamoni Das	06	October

6	**Fine structure of gene:** Classical vs molecular concepts of gene; Ciston, Racon, Muton, rII locus	Dr. Chunamoni Das	04	Oct - Nov
7	**Population and Evolutionary Genetics:** Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation.	Dr. Chunamoni Das	05	November

Botany (Hon.); Semester**: 3RD; Paper: HC- 3036; 7**.2: **Practical -** Detailed

Paper: HC- 3036; 7.2 - PRACTICAL (*Genetica)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Meiosis through temporary squash preparation.	Dr. Chunamoni Das	02	August
2	Mendel's laws through seed ratios.	Dr. Chunamoni Das	02	August
3	Chromosome mapping using point test cross data.	Dr. Chunamoni Das	02	August
4	Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).	Dr. Chunamoni Das	02	September
5	Permanent Slides showing Translocation Ring, Photograph showing Laggards and Inversion Bridge.	Dr. Chunamoni Das	02	September

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session: 2020 -21

Botany (Hon.); Semester**: 3RD; Paper: HG-RC- 3016; -** Outline

Department:	BOTANY	Semester	THIRD
Course:	REGULAR	Paper No:	HG-RC-3016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 3RD; Paper: HG-RC- 3016; 3**.1: **Theory –** Detailed

Paper: HG-RC- 3016 - 3.1 - THEORY (*Plant Physiology and Metabolism)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Plant-water relations:** Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.	Dr. Kamal Choudhury	08	August
2	**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.	Miss Kasturi Talukdar	06	August
3	**Translocation in phloem:** Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading.	Dr. Kamal Choudhury	06	Aug - Sept
4	**Photosynthesis:** Photosynthetic Pigments; Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C3, C4 and CAM pathways of carbon fixation; Photorespiration.	Dr. Chunamoni Das	05	Sept. –Oct
5	**Respiration:** Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway.	Dr. Chunamoni Das	05	October
6	**Enzymes:** Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition**.**	Dr. Chunamoni Das	03	Oct - Nov
7	**Nitrogen metabolism:** Biological nitrogen fixation; Nitrate and ammonia assimilation	Miss Kasturi Talukdar	05	Aug - Sept
8	**Plant growth regulators:** Discovery and physiological roles of auxins, gibberellins,	Dr. Kamal Choudhury	06	Sept. Oct.

	cytokinins, ABA, ethylene.			
9	**Plant response to light and temperature:** Photoperiodism (SDP, LDP, Day neutral plants); Phytochrome, red and far red light responses on photomorphogenesis; Vernalization.	Miss Kasturi Talukdar	06	Sept.-Oct.

Botany (Hon.); Semester**: 3RD; Paper: HG-RC- 3016; 3**.2: **Practical -** Detailed

Paper: HC- 3036; 3.2 - PRACTICAL (*Genetics*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Determination of osmotic potential of palnt cell-sap by palmolytic methos.	Dr. Kamal Choudhury	02	August
2	To study the effect of light on transpiration by excised twig.	Dr. Kamal Choudhury	02	August
3	Calculation of stomatal index and stomatal frequency	Dr. Chunamoni Das	02	August
4	Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.	Dr. Chunamoni Das	02	September
5	To study the effect of bicarbonate concentration on O2 evolution in photosynthesis.	Miss Kasturi Talukdar	02	September
6	**Demonstration experiments** 1. Bolting. 2. Effect of auxins on rooting. 3. Suction due to transpiration. 4. R.Q. 5. Respiration in roots.	Miss Kasturi Talukdar		

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi

Session**:** **2020-2021**
Semester: **Fifth Semester**
Course: **Major**

OUTLINE OF THE COURSE:

Paper	Allotment of Marks			Credits
	Course work	Internal Assessment	Total	
M 501 (Theory)	60	15	75	06
M 502 (Theory)	60	15	75	06
M 503 (Theory)	60	15	75	06
M 504 (Theory)	60	15	75	06
M 505 (Practical)	60	15	75	06
M 506 (Practical)	60	15	75	06
Total	**360**	**90**	**450**	**36**

BOTANY (Major); Semester: 5TH; Paper: M 501 (Theory) - Detailed

Paper: M 501 (Theory) **(*Microbiology and Immunology*)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**General Microbiology:** History and development, scope of Microbiology, introduction to microbial world, microbial taxonomy and its modern trends	Dr. Kamal Choudhury	10	August
II	**Microbial nutrition,** growth and metabolism, microbiology of soil, air, water, biogeochemical cycles, biological nitrogen fixation	Dr. Kamal Choudhury	10	Aug. –Sept.
III	Distinguishing features of Actinomycetes, Archaebacteria and Mycoplasma	Dr. Kamal Choudhury	10	September
IV	**Bacteria:** General account; Classification Bacterial cell structure, Reproduction and Growth; General account of Rickettsiae, Chlamydeae and diseases caused by them	Dr. Kamal Choudhury	10	Sept. –Oct.
V	**Virus:** General characteristics; Classification Nature; Replication, Transmission Viroids, Virusoides, Prions, Transmission of viruses	Dr. Kamal Choudhury	10	Oct. –Nov.
VI	**Immunology**, types of immunity, cell mediated and humoral immunity, primary and secondary immune responses, antigen and antibody.	Dr. Kamal Choudhury	10	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (Major); Semester: 5TH; Paper: M 502 (Theory) - Detailed

Paper: M 502 (Theory) **(Plant Pathology and Lichen)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	General account and historical development; Common symptoms of plant disease; Types of plant diseases according to major causal agents; Disease resistance; Physiology of parasitism; Host-parasite interaction.	Miss Kasturi Talukdar	10	August
II	Concept of disease cycle, mechanism of disease development, dissemination and transmission of plant pathogens, Epidemiology and Disease forecasting	Miss Kasturi Talukdar	10	Aug. –Sept.
III	Defence mechanism: concept and definition; structural, chemical and biochemical mechanisms	Miss Kasturi Talukdar	10	September
IV	Study of following diseases Late blight of potato, Rust of wheat, Grey blight of tea, White rust of crucifers, Powdery mildew of pea, Leaf spot disease of cabbage, Citrus canker, Yellow mosaic of bhindi, , papaya and Tobacco mosaic virus (TMV) disease	Miss Kasturi Talukdar	10	Sept. –Oct.
V	Plant disease management- chemical control, biological control and development of transgenic for controlling plant diseases	Miss Kasturi Talukdar	10	Oct. –Nov.
VI	**Lichens:** General account, classification, structure and reproduction	Miss Kasturi Talukdar	10	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (Major); Semester: 5TH; Paper: M 503 (Theory) - Detailed

Paper: M 503 (Theory) **(Cytogenetics, Plant Breeding and Biometrics)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Principles of inheritance-** Mendel's Laws, deviations to Mendel's law-Incomplete dominance, Co-dominance, Quantitative and polymeric gene interaction, sex linked inheritance, Non-mendelian inheritance, extra chromosomal inheritance	Dr. Chunamoni Das	10	August
II	**Polyploidy:** Structural and numerical changes of chromosome: Structural changes- Chromosomal aberrations and evolutionary significance; Numerical changes- Euploidy (Polyploidy) and evolutionary significance	Dr. Chunamoni Das	10	Aug. –Sept.
III	Linkage and crossing over, recombination and cytological basis of crossing over, linkage map.	Dr. Chunamoni Das	10	September
IV	**Plant Breeding:** Principles of plant breeding- Introduction, selection, hybridization and back cross method	Dr. Chunamoni Das	10	Sept. –Oct.
V	**Plant Breeding:** Heterosis and inbreeding depression- genetic basis; male sterility	Dr. Chunamoni Das	10	Oct. –Nov.
VI	**Biometrics:** Mean, mode, median, standard deviation, t-test, chi-square test, measurement of gene frequency, Hardy-Weinberg equilibrium	Dr. Chunamoni Das	10	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (Major)**; Semester: 5TH; Paper: M 504** (Theory) **- Detailed**

Paper: M 504 (Theory) **(Applied Botany)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Algae** as food, feed, medicine and commercial products, role of algae in soil fertility	Miss Kasturi Talukdar	10	Sept. –Oct.
II	**Fungi-** Role of fungi in agriculture, fungi as food, medicine and commercial products (Antibiotics, alcohols), mycotoxins and mycotoxicosis, **Lichens** as indicator plants, **Mycorrhiza** and its role in plant development, Allergy and allergens.	Miss Kasturi Talukdar	10	Sept. –Oct.
III	**Bacteria**- useful and harmful effects, role of bacteria in agriculture, medicine, bioremediation, serology.	Dr. Kamal Choudhury	10	Oct. –Nov.
IV	**Plant Breeding:** Breeding for disease resistance, induced mutation and crop improvement, induction of polyploidy and crop evolution.	Dr. Chunamoni Das	10	Sept. –Oct.
V	**Deforestation** and its effect on environment, impact of climate change.	Dr. Kamal Choudhury	10	November
VI	**Plant growth regulators:** Application in agriculture, methods of plant propagation- grafting, layering and budding; bonsai, indoor gardening.	Dr. Chunamoni Das	10	Oct. –Nov.

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (Major); Semester: 5TH; Paper: M 505 (Practical) - Detailed

Paper: M 505 (Practical) **(Microbiology, Plant Pathology and Lichen)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Microbiology:** Gram staining of Bacteria	Dr. Kamal Choudhury	04	September
II	**Microbiology:** Preparation, Sterilization of culture media: Basic liquid media (Broth) for cultivation of bacteria; Basic solid media for routine cultivation of fungi.	Dr. Kamal Choudhury	06	Sept. –Oct.
III	**Microbiology:** Isolation of soil microorganisms by the serial dilution and agar plating method. Isolation of microorganisms from air	Dr. Kamal Choudhury	04	Sept. –Oct
IV	**Microbiology:** Isolation of fungal pathogens from diseased plant parts.	Dr. Kamal Choudhury	04	Oct. –Nov.
V	**Microbiology:** Pure culture technique: Streak-plate methods; Pour-plate method..	Dr. Kamal Choudhury	04	Oct. –Nov.
VI	**Microbiology:** Counting of bacterial cells using haemocytometer	Dr. Chunamoni Das	04	November
VII	**Plant Pathology:** Isolation and culture of plant pathogen and establishment of Koch's postulates and their pathogenicity.	Miss Kasturi Talukdar	04	September
VIII	**Plant diseases** - Late blight of potato; Black rust of *Justicia* and wheat*;* Leaf spot of cabbage; Grey blight of tea; Citrus canker; Yellow mosaic of papaya and bhindi; Tobacco mosaic virus and Viral diseases studying their symptoms and by making permanent slides.	Miss Kasturi Talukdar	06	Sept. –Oct.
IX	**Lichen:** Study the thallus morphology of Foliose; Crustose; Fruticose Lichens.	Dr. Kamal Choudhury	04	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (Major); Semester: 5TH; Paper: M 506 (Practical) - Detailed

Paper: M 506 (Practical) **(Cytogenetics, Plant Breeding, Biometrics and Applied Botany)**				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
1	Karyotype study in onion, garlic and Aloe vera	Dr. Chunamoni Das	04	August
2	Study of chromosomal aberration in *Tradescantia* / Rhoeo	Dr. Chunamoni Das	04	Aug.- Sept.
3	Study of gene interaction	Dr. Chunamoni Das	04	September
4	Study of emasculation process in any plant.	Dr. Chunamoni Das	02	October
5	To work out mean, mode, standard deviation and standard error	Dr. Chunamoni Das	06	Oct. –Nov.
6	Isolation of *Rhizobium* from root nodules	Dr. Kamal Choudhury	04	November
7	Counting of pollen grains in honey samples	Dr. Nandini Kakoti	02	November

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi

Session**:** **2020 -2021**
Semester: **Fifth Semester**
Course: **General**

OUTLINE OF THE COURSE:

Paper	Allotment of Marks			Credits
	Course work	Internal Assessment	Total	
E 501 (Theory)	80	20	100	08
E 502 (Theory)	80	20	100	08
Total	**160**	**40**	**200**	**16**

BOTANY (General)**; Semester: 5TH; Paper: E 501** (Theory) **- Detailed**

Paper: M 501 (Theory) **(Structure, Development and Reproduction of Flowering Plants)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	Basic body plan of flowering plant, modular type of growth, diversity in plant forms – annuals, biennials and perennials, Histological organization of root and shoot apices, various theories of cellular organization	Dr. Chunamoni Das	10	August
II	Types of tissue: Meristematic tissue –structure and types based on origin and position, Permanent tissue: Simple, Complex and Secretary, Trichomes and Stomata.	Dr. Kamal Choudhury	10	August
III	Anatomy: Primary structure of root, stem and leaf, Secondary growth, Wood anatomy: Growth rings, heart wood and sap wood, Periderm, Floral biology	Dr. Kamal Choudhury	10	Aug -Sept
IV	Embryology: Microsporogenesis and development of male gametophyte, megasporogenesis and development of female gametophyte, Double fertilization	Miss Kasturi Talukdar	10	August
V	Development of dicot embryo, Structure, development and types of endosperms, Fruit**:** Development, types and parts of fruits, fruit dispersal strategies, Vegetative propagation: Grafting, layering and budding.	Miss Kasturi Talukdar	10	Aug –Sept.
VI	**Seed:** Types of seed, germination of seeds-types and nature and dispersal of seeds, factors affecting germination	Dr. Chunamoni Das	10	Aug –Sept.

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

BOTANY (General)**; Semester: 5TH; Paper: E 502** (Practical) **- Detailed**

Paper: E 502 (Practical) **(*Structure, Development and Reproduction of Flowering Plants*)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	Study of non-living cell inclusion (ergastic maters): Starch grains, Aleurone grains, Raphides, Cystolith.	Dr. Kamal Choudhury	04	Aug. –Sept.
II	Study of types of stomata.	Dr. Chunamoni Das	04	Aug. –Sept.
III	Study of Epidermal Hairs	Miss Kasturi Talukdar	04	Aug. –Sept.
IV	Study of secondary growth in thickness by permanent preparation of differentially stained slide: *Amaranthus*, *Boerhavia*, *Mirabilis*, *Bougainvillea*, *Dracaena*, *Tinospora*.	Dr. Kamal Choudhury	08	Sept. – Oct.
V	Study from permanent slide: T.S. through young and mature anther; Male gametophyte; L.S. of ovule showing different nuclear stages of embryo sac; L.S. of ovule showing types of Endosperm; L.S. of Embryo – Dicotyledonous, Monocotyledonous.	Miss Kasturi Talukdar	06	Sept. – Oct.
VI	Study of spurious fruits, aggregate fruits, composite fruits	Dr. Kamal Choudhury	06	October
VII	Study the adaptation in fruits and seeds for dispersal through air	Dr. Chunamoni Das	04	Sept. – Oct.
VIII	Demonstrate the process of: Budding; Air layering; Scion grafting	Dr. Chunamoni Das	04	October

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 2nd; Paper: HC- 2016; -** Outline

Department:	BOTANY	Semester	SECOND
Course:	HONOURS	Paper No:	HC-2016 (Theory)
Credit:	Theory - 04	Total Lectures	60
	Practical -02		

Botany (Hon.); Semester**: 2nd; Paper: HC- 2016; 3.1**: **Theory -** Detailed

Paper: HC- 2016 - 3.1 - THEORY (*Mycology and Phytopathology)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Introduction to Fungi:** General characteristics; Thallus organization, Cell and Cell wall; Nutrition, flagella, septum, homothallism and heterothallism, cell division. Classification of Fungi General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota and Deuteromycota.	Miss Mridusmita Das	08	August
2	**Mastigomycotina (Chytridiomycetes and Oomycetes):** Characteristic features; Reproduction; Life cycle with reference to *Synchytrium*, *Phytophthora* and *Albugo*.	Miss Mridusmita Das	04	August
3	**Zygomycotina:** Characteristic features; Reproduction; Life cycle with reference to Rhizophus..	Miss Mridusmita Das	04	August
4	**Ascomycotina:** General characteristics (asexual and sexual fruiting bodies); Life cycle, Heterokaryosis and parasexuality; Life cycle and classification with reference to *Saccharomyces*, *Aspergillus*, *Penicillium*, *Neurospora* and *Peziza*.	Miss Mridusmita Das	04	September
5	**Basidiomycotina:** General characteristics; Life cycle and Classification with reference to black stem rust on wheat *Puccinia*, loose and covered smut, *Agaricus*; Bioluminescence, Fairy Rings and Mushroom Cultivation.	Miss Mridusmita Das	05	September
6	**Deuteromycotina (Fungi Imperfecti):** General characteristics; Thallus organization; reproduction; Classification with special reference to Alternaria and Colletotrichum.	Miss Mridusmita Das	04	September

7	**Allied Fungi- Myxomycota:** General characteristics; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies.	Miss Mridusmita Das	04	October
8	**Symbiotic associations:** Lichen – Occurrence; General characteristics; Range of thallus organization; Internal structure and nature of associations of algal and fungal partners; Reproduction. Mycorrhiza- Ectomycorrhiza, Endomycorrhiza and their significance.	Dr. Kamal Choudhury	03	
9	**Applied Mycology:** Role of fungi in biotechnology; food; Pharmaceutical (Secondary metabolites); Agriculture; Mycotoxins; Biological control, Medical mycology.	Dr. Kamal Choudhury	05	
10	**Phytopathology:** Terms and concepts; Symptoms; Distribution of diseases; Etiology; Host-Pathogen relationships; Disease cycle and environmental relation; prevention and control of diseases, and role of quarantine. Bacterial diseases – Citrus canker and angular leaf spot of cotton. Viral diseases – TMV, vein clearing. Fungal diseases – Early blight of potato, Black stem rust of wheat, White rust of crucifers.	Miss Mridusmita Das	06	

Botany (Hon.); Semester**: 2nd; Paper: HC- 2016; 3**.2: Practical **-** Detailed

Paper: HC- 2016; 3.2 - PRACTICAL (*Mycology and Phytopathology*)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	1. **Rhizopus:** study of asexual stage from temporary mounts and sexual structures through permanent slides. 2. **Aspergillus & Penicillium:** study of asexual stage from temporary mounts. Sexual stage from permanent slides/ photographs. 3. **Peziza:** sectioning through ascocarp. 4. **Alternaria:** Specimens/photographs and temporary mounts.	Miss Mridusmita Das	02	August
2	5. **Puccinia:** Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts. **Agaricus:** Sectioning of gills of Agaricus, fairy rings and bioluminescent mushrooms to be shown. **7. Albugo:** Study of symptoms of plants infected with Albugo; asexual phase - section/ temporary mounts; sexual structures through permanent slides.	Miss Mridusmita Das	04	August
3	**Lichens:** Study of growth forms of lichens. Study of thallus and reproductive structures through permanent slides. **Mycorrhizae**: ectomycorrhiza and endomycorrhiza (Photographs)	Dr. Kamal Choudhury	02	Aug - Sept
4	**Phytopathology:** Bottle specimens, Herbarium specimens should be made of bacterial diseases, Viral diseases, Fungal diseases **Applied mycology:**	Dr. Kamal Choudhury	02	September

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 2nd; Paper: HC- 2026; -** Outline

Department:	BOTANY	Semester	SECOND
Course:	HONOURS	Paper No:	HC-2016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 2nd; Paper: HC- 2026; 4**.1: **Theory -** Detailed

Paper: HC- 2016 - 4.1 - THEORY (*Archegoniate)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Introduction:** Unifying features of archegoniates; Transition to land habit; Alternation of generations.	Dr. Kamal Choudhury	03	September
2	**Bryophytes:** General characteristics; Adaptations to land habit; Classification; Range of thallus organization.	Dr. Chunamoni Das	04	August
3	**Bryophytes:** Classification, morphology, anatomy and reproduction of Riccia, Marchantia, Anthoceros, Sphagnum and Polytrichum; Reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros, Sphagnum and Polytrichum. Ecological and economic importance of bryophytes.	Dr. Chunamoni Das	10	Aug- Sept
4	**Pteridophytes:** General characteristics; Classification; Early land plants (Cooksonia and Rhynia).	Dr. Kamal Choudhury	05	Sept -Oct
5	**Pteridophytes: Pteridophytes:** Classification, morphology, anatomy and reproduction of Psilotum, Lycopodium, Selaginella, Equisetum, Pteris and Marsilea. Apogamy and apospory, heterospory and seed habit, telome theory, stelar evolution; Ecological and economic importance.	Dr. Kamal Choudhury	12	Oct -Nov
6	**Gymnosperms:** General characteristics, classification (up to family), morphology, anatomy and reproduction of Cycas, Pinus, Ginkgo and Gnetum; Ecological and economic importance.	Dr. Chunamoni Das	10	Sept- Oct

Botany (Hon.); Semester**: 2nd; Paper: HC- 2016; 4**.2: Practical **-** Detailed

Paper: HC- 2016; 4.2 - PRACTICAL (*Archegoniate*)				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
1	**Riccia** – Morphology of thallus. **Marchantia**- Morphology of thallus and reproductive parts; section of thallus & reproductive parts. **Sphagnm**- Morphology of plant; **Polytrichum**- Morphology of vegetative and reproductive parts; T S of Vegetative parts, LS of reproductive parts.	Dr. Kamal Choudhury	06	October
2	**Lycopodium**, **Selaginella, Equisetum, Marsilea** - Morphology of plant, transverse section of stem; Longitudinal Section of strobilus; morphology of sporophyll. **Pteris**- Morphology of plant, transverse section of rachis, vertical section of leafletthrough sorus **Marsilea**- Morphology, TS of rhizome and petiole; section of sporocarp.	Dr. Kamal Choudhury	06	Oct -Nov
3	**Cycas**- Morphology of plant; morphology and transverse section of coralloid roots; transverse section of leaflets; Longitudinal Section of male and female cone. **Pinus**- Morphology of plant; transverse section of Needle; longitudinal section of male cone and female cone; **Ginkgo**- Morphology of plants and reproductive structures (only photographs). **Gnetum**- Morphology of plant; Morphology of male and female strobilus; vertical section of ovule (permanent slide).	Dr. Chunamoni Das	06	Sept -Oct

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 2nd; Paper: HG-RC- 2016; -** Outline

Department:	BOTANY	Semester	SECOND
Course:	REGULAR	Paper No:	HG-RC -2016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 2nd; Paper: HG-RC- 2016; 2**.1: **Theory -** Detailed

Paper: HG-RC- 2016 - 2.1 - THEORY

(*Plant Ecology and Taxonomy*)

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Introduction**	Dr. Chunamoni Das	02	August
2	**Ecological factors: Soil**: Origin, formation, composition, soil profile. **Water**: States of water. **Light and temperature**: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes.	Dr. Chunamoni Das	04	August
3	**Plant communities:** Characters; Ecotone and edge effect; Succession; Processes and types.	Dr. Chunamoni Das	04	Aug-Sept
4	**Ecosystem:** Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous	Dr. Chunamoni Das	04	Sept -Oct
5	**Phytogeography:** Principal biogeographical zones; Endemism	Miss Mridusmita Das	04	August
6	**Introduction to plant taxonomy:** Identification, Classification, Nomenclature.	Dr. Kamal Choudhury	03	September
7	**Identification:** Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access	Dr. Kamal Choudhury	04	October
8	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data.	Miss Mridusmita Das	06	Aug -Sept

9	**Taxonomic hierarchy:** Ranks, categories and taxonomic groups	Dr. Kamal Choudhury	02	September
10	**Botanical nomenclature:** Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	Dr. Kamal Choudhury	04	Sept -Oct
11	**Classification:** Types of classification-artificial, natural and phylogenetic. Bentham and Hooker, Engler and Prantl (upto series).	Dr. Kamal Choudhury	03	November
12	**Biometrics, numerical taxonomy and cladistics** Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms	Miss Mridusmita Das	04	October

Botany (Hon.); Semester**: 2ND; Paper: HG-RC- 2016; 2**.2: Practical - Detailed

Paper: HC- 2016; 4.2 - PRACTICAL (*Plant Ecology and Taxonomy)*				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
1	Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.	Miss Mridusmita Das	02	August
2	Study of morphological adaptations of hydrophytes and xerophytes (four each).	Miss Mridusmita Das	02	August
3	Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method.	Dr. Chunamoni Das	02	Aug - Sept
4	Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.	Dr. Chunamoni Das	02	September
5	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Brassicaceae, Solanaceae, Lamiaceae.	Dr. Kamal Choudhury	06	September
6	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	Dr. Kamal Choudhury	02	October

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 4TH; Paper: HC- 4016; -** Outline

Department:	BOTANY	Semester	FOURTH
Course:	HONOURS	Paper No:	HC -4016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 4TH; Paper: HC- 4016; 8**.1: **Theory -** Detailed

Paper: HC- 4016 - 8.1 - THEORY

(*Molecular Biology)*

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Nucleic acids : Carriers of genetic information** Historical perspective; DNA as the carrier of genetic information (Griffith's, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrat's experiment.	Dr. Chunamoni Das	04	August
2	**The Structures of DNA and RNA:** DNA Structure: Miescher to Watson and Crick- historic perspective, DNA structure, Salient features of double helix, denaturation and renaturation, cot curves; Organization of DNAProkaryotes, Viruses, Eukaryotes. Organelle DNA -- mitochondria and chloroplast DNA. The Nucleosome Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin.	Dr. Chunamoni Das	10	August
3	**The replication of DNA:** Chemistry of DNA synthesis; General principles – bidirectional, semiconservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, θ (theta) mode of replication, replication of linear ds-DNA; Enzymes involved in DNA replication.	Dr. Chunamoni Das	10	September
4	**Central dogma and genetic code:** Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code	Dr. Chunamoni Das	02	September

5	**Transcription:** Transcription in prokaryotes and eukaryotes. Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in *E.coli.* Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing.	Dr. Chunamoni Das	12	October
6	**Processing and modification of RNA:** Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I and group II intron splicing, alternative splicing eukaryotic mRNA processing; Ribozymes; RNA editing and mRNA transport.	Dr. Chunamoni Das	06	Oct - Nov
7	**Translation:** Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins.	Dr. Chunamoni Das	06	November

Botany (Hon.); Semester**: 4TH; Paper: HC- 4016; 8**.2: Practical - Detailed

Paper: HC- 4016; 8.2 - PRACTICAL (*Molecular Biology)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	DNA isolation from any plant material. DNA estimation by diphenylamine reagent/UV Spectrophotometry (Demostration).	Dr. Chunamoni Das	04	August
2	Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).	Dr. Chunamoni Das	02	August
3	Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs	Dr. Chunamoni Das	02	Aug - Sept
4	Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing.	Dr. Chunamoni Das	02	September

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 4TH; Paper: HC- 4026; -** Outline

Department:	BOTANY	Semester	FOURTH
Course:	HONOURS	Paper No:	HC -4026 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 4TH; Paper: HC- 4026; 9**.1: **Theory -** Detailed

Paper: HC- 4026 - 9.1 - THEORY
(*Plant Ecology and Phytogeography)*

Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Introduction:** Basic concepts; Levels of organization. living world and the environment, the components and dynamism, homeostasis.	Miss Mridusmita Das	04	August
2	**Soil:** Importance; Origin; Formation; omposition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil devlopment.	Miss Mridusmita Das	04	August
3	**Water**States of water in the environment; Atmospheric moisture; Precipitation types; Hydrological Cycle; Water in soil; Water table.	Miss Mridusmita Das	04	August
4	**Adoptation of plants to various environmental factors:** Light, temperature, wind and fire	Miss Mridusmita Das	04	August
5	**Biotic interactions:** Trophic organization, basic source of energy, autotrophy, heterotrophy; symbiosis, commensalism, parasitism; food chains and webs; ecological pyramids; biomass, standing crop.	Miss Mridusmita Das	02	Aug -Sept
6	**Population ecology:** Population characteristics, Growth curve, population regulation, r and k selection. Ecological speciation: Allopatric/ Sympatric and Parapatric speciation.	Miss Mridusmita Das	04	September
7	**Plant communities: E**cological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession – processes, types; climax concepts.	Miss Mridusmita Das	04	September
8	**Ecosystems:** Structure; Processes; Trophic organisation; Food chains and Food webs; Ecological pyramids.	Miss Mridusmita Das	04	Sept. -Oct

9	**Functional aspects of ecosystem:** Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.	Miss Mridusmita Das	04	Oct - Nov
10	**Phytogeography:** Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes; Phytogeographical division of India; Vegetation types of NE India with special reference to Assam.	Miss Mridusmita Das	06	November

Botany (Hon.); Semester**: 4TH; Paper: HC- 4026; 9.1**: Practical - Detailed

Paper: HC- 4026; 9.2 - PRACTICAL (*Plant Ecology and Phytogeography)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter. Determination of pH of various soil and water samples using pH meter.	Miss Mridusmita Das	02	August
2	Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.	Miss Mridusmita Das	03	August
3	Determination of dissolved oxygen of water samples from polluted and unpolluted sources.	Miss Mridusmita Das	02	Aug - Sept
4	(a). Study of morphological adaptations of hydrophytes and xerophytes. (b). Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobanche*) Epiphytes, Predation (Insectivorous plants).	Miss Mridusmita Das	03	September
	(a) Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed). (b) Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law. (c) Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.	Miss Mridusmita Das	06	October
	Field visit to familiarise students with ecology of different sites	All Teachers		October

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 4TH; Paper: HC- 4036; -** Outline

Department:	BOTANY	Semester	FOURTH
Course:	HONOURS	Paper No:	HC -4036 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 4TH; Paper: HC- 4036; 9**.1: **Theory -** Detailed

Paper: HC- 4036 -10.1 - THEORY (*Plant Systematics)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Significance of Plant systematic:** Introduction to systematics; Plant identification, Classification, Nomenclature. Evidences - palynology, cytology, phytochemistry and molecular data. Functions and importance of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Concept of taxa; Categories and taxonomic hierarchy.	Dr. Kamal Choudhury	08	August
2	**Botanical nomenclature:** Principles and rules (ICN); Ranks and names; Typification, author citation, Effective and valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.	Dr. Kamal Choudhury	06	August
3	**Systems of classification:** Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker and Engler and Prantl; Brief reference of APG classification.	Dr. Kamal Choudhury	08	September
4	**Numerical taxonomy and cladistics:** Characters; Variations; OTUs, character weighting and coding; Cluster analysis; Phenograms, cladograms.	Dr. Kamal Choudhury	05	September
5	**Phylogeny of Angiosperms:** Terms and concepts Origin and evolution of angiosperms; Co-evolution of angiosperms and animals; Methods of illustrating evolutionary relationship	Dr. Kamal Choudhury	08	Sept -Oct

6	**Angiospermic Families:** Detail study of the following families: Magnoliaceae, Fabaceae, Asteraceae, Solanaceae, Acanthaceae, Lamiaceae, Euphorbiaceae, Orchidaceae, Musaceae, Zingiberaceae, Poaceae.	Dr. Kamal Choudhury	10	Oct -Nov

Botany (Hon.); Semester**: 4TH; Paper: HC- 4036; 10.2**: Practical - Detailed

Paper: HC- 4036; 10.2- PRACTICAL (*Plant Systematics)*				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	Study of vegetative and floral characters of locally available angiospermic plants belonging to the following families - Fabaceae, Solanaceae, Acanthaceea, Lamiaceae, Euphorbiaceae, Musaceae, Orchidaceae.	Dr. Kamal Choudhury	10	August
2	Field visit to familiarise students with vegetation of an area and identification of plant species / Visit to Academic or Research Institutions. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label.	Dr. Kamal Choudhury		August

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2020 -2021**

Botany (Hon.); Semester**: 4TH; Paper: HG-RC- 4016; -** Outline

Department:	BOTANY	Semester	FOURTH
Course:	REGULAR	Paper No:	HG-RC -4016 (Theory)
Credit:	Theory - 04 Practical -02	Total Lectures	60

Botany (Hon.); Semester**: 4TH; Paper: HG-RC- 4016; 4**.1: **Theory -** Detailed

Paper: HG-RC- 4016 -5.1 - THEORY ***(Plant Anatomy and Embryology)***				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
1	**Meristematic and permanent tissues:** Root and shoot apical meristems; Simple and complex tissues.	Dr. Kamal Choudhury	06	August
2	**Organs:** Structure of dicot and monocot root stem and leaf.	Dr. Kamal Choudhury	04	August
3	**Secondary Growth:** Vascular cambium – structure and function, seasonal activity. Secondary growth in root and stem, Wood.	Dr. Kamal Choudhury	06	August
4	**Adaptive and protective systems:** Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes.	Miss Mridusmita Das	06	September
5	**Structural organization of flower:** Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac.	Miss Mridusmita Das	06	September
6	**Pollination and fertilization*:*** Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms.	Dr. Chunamoni Das	05	August
7	**Embryo and endosperm:** Endosperm types, structure and functions; Dicot and monocot embryo; Embryo- endosperm relationship.	Dr. Chunamoni Das	05	Aug -Sept
8	**Apomixis and polyembryony:** Definition, types and practical applications.	Dr. Chunamoni Das	05	Sept -Oct

Botany (Hon.); Semester**: 4TH; Paper:** HG-RC**- 4016; 5.2**: Practical **–** Detailed

Paper: HG-RC; 5.2- PRACTICAL ***(Plant Anatomy and Embryology)***				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
1	(a) Study of meristems through permanent slides and photographs. (b) Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs) (c) Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides). (d) Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides). (e) Leaf: Dicot and Monocot leaf (only Permanent slides).	Dr. Kamal Choudhury	04	Sept -Oct
2	Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).		04	
3	(a) Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides). (b) Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous (permanent slides) (c) Female gametophyte: Polygonum type of Embryo sac Development (Permanent slides/photographs). (d) Ultrastructure of mature egg apparatus cells through electron micrographs. (e) Pollination types and seed dispersal mechanisms (Photographs and specimens).	Dr. Kamal Choudhury	06	Aug -Sept
4	Dissection of embryo/endosperm from developing seeds.	Miss Mridusmita Das	04	Sept -Oct

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi

Session**:** **2019 - 2020**
Semester: **Sixth Semester**
Course: **Major**

Outline of the Course:

Paper	Allotment of Marks			Credits
	Course work	Internal Assessment	Total	
M 601 (Theory)	60	15	75	06
M 602 (Theory)	60	15	75	06
M 603 (Theory)	60	15	75	06
M 604 (Theory)	60	15	75	06
M 605 (Practical)	60	15	75	06
M 606 (Practical)	60	15	75	06
Total	**360**	**90**	**450**	**36**

Botany (Major); Semester: 6TH; Paper: M- 601 (Theory) **- Detailed**

Paper: M 601 (Theory) **(*Molecular Biology and Plant Biochemistry*)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Molecular Biology:** Structure and organization of gene, expression and regulation of gene, Genetic code; properties and evidences	Mrs. Chunamoni Das	10	Jan. –Feb.
II	**Molecular Biology:** DNA replication, different forms of RNA and their roles, concept of exons and introns, Transcription and Translation in Prokayotes	Mrs. Chunamoni Das	10	February
III	**Molecular Biology:** Mutation: Point mutation- transition, transversion, frameshift mutation, molecular mechanism	Mrs. Chunamoni Das	10	Feb. –Mar.
IV	**Plant Biochemistry:** Nitrogen metabolism, Amino acid metabolism and protein synthesis	Mrs. Chunamoni Das	10	March
V	**Plant Biochemistry:** Enzymes- Classification and nomenclature of enzymes, Enzyme as biocatalyst, properties and function	Mrs. Chunamoni Das	10	Mar. -Apr
VI	**Plant Biochemistry:** Carbohydrate metabolism - Structure of monosaccharides, disaccharides and polysaccharides	Mrs. Chunamoni Das	10	Apr. -May

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2019 -2020**

Botany (Major); Semester: 6TH; Paper: M- 602 (Theory) - Detailed

Paper: M 602 (Theory) **(*Bioinformatics, Computer Application and Biotechnology*)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Bioinformatics:** Introduction to Bioinformatics, branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics, biological databases, classification format of databases, biological database retrieval system	Miss Mridusmita Das	12	Jan. –Feb.
II	**Bioinformatics:** DNA replication, different forms of RNA and their roles, concept of exons and introns, Transcription and Translation in Prokayotes	Miss Mridusmita Das	12	February
III	**Computer Applications:** Basics of computer**,** use of operating system (MS Office)**,** Data representation, Internet browsing and searching of biological data using search engines	Mr. Amitabh Sarma (Dept. of Computer Science)	12	Feb. –Mar.
IV	**Biotechnology:** History, scope and significance of biotechnology	Miss Mridusmita Das	12	March
V	**Biotechnology:** Plant Tissue culture-different techniques, micropropagation, meristem culture, embryo culture, somatic embryogenesis, pollen culture and development of haploid plants, somaclonal variation, transgenic plants	Miss Mridusmita Das	12	Mar. -Apr
VI	**Biotechnology:** Plant genetic engineering, techniques and applications: (restriction enzymes, construction of DNA libraries, DNA fingerprinting, DNA sequencing), application in agriculture and medicines	Miss Mridusmita Das	12	Apr. -May

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2019 -2020**

Botany (Major); Semester: 6TH; Paper: M- 603 (Theory) - Detailed

Paper: M 603 (Theory) (***Plant Physiology***)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	Plant-soil-water relationship: component and classification of soil, Soil to plant-water potential, osmotic potential, Movement of water within the plant body: absorption, transpiration and its significance, factors, mechanisms of transpiration, ascent of sap	Dr. Kamal Choudhury	10	Jan. –Feb.
II	Mineral nutrition and mineral salt absorption, criteria of essentiality of elements, micro and macro nutrients- specific functions and deficiency symptoms, mineral salt absorption	Dr. Kamal Choudhury	10	February
III	Photosynthesis: photolysis of water, cyclic and non-cyclic photophosphorylation, electron transport system, C3 cycle, photorespiration and glycolytic metabolism (C2 cycle), CAM pathway, C4 cycle, chemosynthesis	Dr. Kamal Choudhury	10	Feb. –Mar.
IV	Respiration: Aerobic respiration, Glycolysis (EMP, PPP) and TCA cycles and its regulation, anaerobic respiration mechanism and factors	Dr. Kamal Choudhury	10	March
V	Translocation of organic solutes: mechanism of translocation, diffusion, Munch hypothesis, source and sink relationships, phloem loading and unloading	Dr. Kamal Choudhury	10	Mar. -Apr
VI	Growth and development: Phages of growth, growth regulation-physiological role and mechanism of action (Auxins, cytokinins, GA, ABA, ethylene); Physiology of flowering - photoperiodism and vernalization; seed dormancy-types and causes, methods of overcoming dormancy; senescence and aging; stress physiology-concept of biotic, abiotic and xenobiotic stresses.	Dr. Kamal Choudhury	10	Apr. -May

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2019 -2020**

Botany (Major); Semester: 6TH; Paper: M- 604 (Theory) - Detailed

Paper: M 604 (Theory) (***Plant Resource Utilization***)				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Origin of Cultivated Plants**: Concept of centers of origin; Plant introduction; Crop domestication; Classification of plant resources on the basis of their uses; Cereals: Rice, wheat and their role in green revolution; Leguminous plant resources: soybean, arhar dal, pea - their products and uses	Dr. Kamal Choudhury	10	March
II	**Beverages:** Tea, Coffee and cocoa - their sources, products and uses; Spices and condiments: Sources and uses of black pepper, cinnamon, clove, bay leaf, turmeric, zinger; Oil: Mustard, groundnut, castor and citronella	Dr. Kamal Choudhury	10	Apr. -May
III	Fibers - Botany and uses of cotton, jute and ramie; Fruits - orange, pineapple, banana; Products and byproducts of sugar industry - Sugarcane, sugar beat	Miss Mridusmita Das	10	March
IV	**Timber and non-timber plant resources:** sal, gamari, teetasopa; Botany and uses of cane and bamboo, Para-rubber, herbal dye (henna, manjistha, bixa); Botany and uses of medicinal plants (*Holarhhena, Rauvolfia, Catharanthus, Taxus, Plumbago, Azadirachta, Andrographis*)	Miss Mridusmita Das	10	Apr. -May
V	Pharmacognosy: Pharmacognosy and its importance in medicinal plant uses	Mrs. Chunamoni Das	10	March
VI	**Ethnobotany**: Definition, concept and scope; discipline and sub-disciplines of ethnobotany, importance of traditional knowledge in relation to plant uses and IPR (Intellectual Property Rights); stress physiology-concept of biotic, abiotic and xenobiotic stresses.	Mrs. Chunamoni Das	10	April

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2019-2020**

Botany (Major); Semester: 6TH; Paper: M- 605 (Practical) - Detailed

Paper: M 605 (Practical) (***Molecular Biology, Biotechnology, Bioinformatics and Computer Application***)				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
I	**Molecular Biology:** 1. Curve of protein and determine protein content in plant materials by Biuret method. 2. Separate and identify amino acids by Paper Chromatography, Thin Layer chromatography. 3. Quantitative estimation of reducing sugar and total sugar by Somogyi's method. 6. Estimation of Total Nitrogen by Micro Kjeldahl method. 4. Separate and identify chlorophyll pigments by Paper Chromatography. 5. Determine Titratable Acid Number (TAN) in Bryophyllum leaves.	Mrs. Chunamoni Das	10	March
II	**Biotechnology:** 1. Preparation and sterilization of the medium, Slant preparation and Inoculation - MS medium. 2. Micro propagation of some important plants. 3. Study of Genetic engineering Techniques (photographs): FISH, DNA Fingerprinting, DNA Sequencing, Gene gun, Ti plasmid. 4. Study of steps of genetic engineering techniques from photographs (Bt cotton, Golden rice, Flavr Savr tomato) 5. Construction of Restriction Map from the data provided. 6. Aseptic seed germination - legume seed 7. Study of different bio fertilizers. 8. Homology Modeling through the BLAST	Mrs. Chunamoni Das	10	March
III	**Bioinformatics:** 1. Nucleic acid and protein databases. 2. Sequence retrieval from databases. 3. Sequence alignment. 4. Sequence homology and Gene annotation. 5. Construction of phylogenetic tree	Dr. Pankaj Dar (Guest Teacher, Pub Kamrup College)	10	April -May
IV	**Computer Application:**	Mr. Amitabh Sarma (Dept. of Computer Science	10	April -May

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi
Session**: 2019-2020**

Botany (Major); Semester: 6TH; Paper: M- 606 (Practical) - Detailed

Paper: M 605 (Practical) **(*Molecular Biology, Biotechnology, Bioinformatics and Computer Application*)**				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
I	**Plant Physiology:** 1. Determine the osmotic potential of cell sap by plasmolytic method. 2. Determine the water potential of plant tissue. 3. Determine the stomatal index, stomatal frequency and estimate the transpiration rate of different types of leaves. 4. Study the effect of temperature on the rate of imbibitions and determine the Q10. 5. Determine RQ of different plant materials (Seeds, Leaf buds, Flower buds). 6. Extract and separate chloroplast pigments by solvent method and Paper chromatography 7. Determine effect of CO2 concentration on the rate of photosynthesis.	Dr. Kamal Choudhury	20	Mar.- Apr.
2	**Plant Resource Utilization:** 1. Chemical tests for tannins (Tea); Alkaloids (*Vinca rosea*) 2. Pharmacognosical studies of both crude and powdered drugs - Zinger, Holarrhena, Rauwolfia 3. Histochemical test for *Curcuma longa*, starch in non-lignified vessels (Zingiber); Alkaloid (*Andrographis*, Neem and *Plumbago*)	Miss Mridusmita Das	20	Mar.- Apr.

TEACHING PLAN
Department of Botany, SBMS College, Sualkuchi

Session**:** **2020 2021**
Semester: **Sixth Semester**
Course: **General**

Outline of the Course:

Paper	Allotment of Marks			Credits
	Course work	Internal Assessment	Total	
E 601 (Theory)	80	20	100	08
E 602 (Practical)	80	20	100	08
Total	**160**	**40**	**200**	**16**

Botany (General); Semester: 6TH; Paper: E- 601 (Theory) **- Detailed**

Paper: E 601 (Theory) **(*Ecology and Utilization of Plants*)**				
Unit	Course Content	Allotted to	Hours/ Lecture	Month
I	**Ecology**: Introduction, concept, definition, Autecology and Synecology, Ecosystem Ecology: Introduction, ecological organization – species population, community ecosystem and biosphere, Kinds of ecosystem, structure and function of ecosystem, abiotic components, biotic components and their role.	Dr. Kamal Choudhury	10	Jan. –Feb.
II	**Ecology:** Ecological succession-Types and pattern, food chain, food web, ecological pyramid	Mr. Chunamoni Das	10	Jan. –Feb.
III	**Ecology:** Bio-geo-chemical cycles-concept, details of Nitrogen and carbon cycle, Composition and functioning of ecosystem: i) Simple – pond ecosystem, ii) Complex – forest ecosystem, iii) Artificial – crop land ecosystem.	Mr. Chunamoni Das	10	Feb. -Mar
IV	**Ecology:** Ecological grouping of plants with reference to their significance of adaptive external and internal features: Hydrophytes and Xerophytes. Environmental pollution with special reference to Air and Water pollutions - causes, effects and control measures; Green house effect.	Dr. Kamal Choudhury	10	Feb. –Mar.

V	**Utilization of Plants**: Classification of plants on the basis of Botanical sources and uses of Rice, Wheat, Maize,	Dr. Kamal Choudhury	10	Mar. -April
VI	**Utilization of Plants**: Sugar cane**,** Gram, Pea, Coffee and Tea, Black pepper, Turmeric, Clove, and mustard - Their uses and botanical sources	Mr. Chunamoni Das	10	Mar. -April
VII	**Utilization of Plants**: Non timber plant products - Cotton, Jute, Rubber, Bamboo, and Jatropha. Their uses and botanical sources	Miss Mridusmita Das	10	Jan. –Feb.
VIII	**Utilization of Plants**: Timber and medicinal plant resources: Teak, Sal, Rauvolfia, Neem, Cinchona-their uses and botanical sources	Miss Mridusmita Das	10	March

Botany (Gen.); Semester: 6TH; Paper: E- 601 (Practical) **- Detailed**

Paper: E 601 (Practical) **(*Ecology and Utilization of Plants*)**				
S. No.	Course Content	Allotted to	Hours/ Lecture	Month
I	**Ecology:** 1. Determine the frequency and density of herbaceous species by quadrate method 2. Study the anatomical features of - **Hydrophytes:** Root- Eichhornia, Petiole - Eichhornia, stem-Hydrilla, Nymphaea petole. **Xerophytes:** Leaf of Nerium, Leaf of Thevetia, Leaf of Grass. 3. Test for the presence of inorganic salts in the soil: Chloride, Sulphate, Phosphate.	Dr. Kamal Choudhury Dr. Chunamoni Das	20	Mar.- Apr.
2	**Utilization of Plants:** 1. Study the morphology, parts used, chemical nature and uses of the following plants a) Cereals – Rice. b) Pulses and legumes – Pea. c) Beverages – Tea. d) Fibres – Cotton, Jute e) Fats and oils –Mustard. f) Spices – Black pepper, Turmeric. g) Medicinal – Rauvolfia, Neem. h) Fuel – Jatropha. i) Sugar-Sugar cane	Miss Mridusmita Das	20	Mar.- Apr.

****