Academic Session 2020-21

DEPARTMENT OF BOTANY

SEMESTER I- Honours CORE COURSE 1 (THEORITICAL)
PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PHYCOLOGY	General account: Thallus organization, Structure of algal cell, Ultrastructure of Plastids and Flagella,	RP	Online teaching	3 hr

	Origin and evolution of sex, Life cycle patterns, Significant contributions of important phycologists (Fritsch, Smith, R. N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar)		through Google meet, ppt, interactive discussion	
	Classification: Criteria and basis of Fritsch's classification, Classification by Lee (2008) upto phylum with examples, Salient features of Cyanobacteria, Rhodophyta, Chlorophyta , Charophyta, Bacillariophyta, Xanthophyta, Phaeophyta, Heterokantophyta.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Cyanobacteria: Ultrastructure of cell, Heterocyst - structure and function, Ecology	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Bacillariophyta: Cell structure, Cell division, Auxospore formation in Centrales and Pennales	RP	Online teaching through Google meet, ppt,	3 hr

			interactive discussion	
	Life History: *Chlamydomonas, Oedogonium, Chara, Ectocarpus, Polysiphonia*, Evolutionary significance of Prochloron	RP	Online teaching through Google meet, ppt, interactive discussion	10 hr
MICROBIOLOGY	Virus: Discovery, Plant virus- types, Transmission and translocation of Plant virus, TMV- Physicochemical characteristics and Multiplication, One step growth curve, Lytic cycle (T4 phage) and Lysogenic cycle (Lambda phage), Significance of lysogeny, Viroids and Prions	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Bacteria: Discovery, Distinguishing features of Archaea and Bacteria, Characteristics of some major groups: Proteobacteria (Enterobacteria), Firmicutes, Mollicutes, Actinobacteria, Spirochaetes, Chlamydiae, Bacterial growth curve and generation time, Flagella (ultrastructure) & Pilli, Cell wall – chemical structure and differences between Gram	MM	Online teaching through Google meet, ppt, interactive discussion	6 hr

	+ve & Gram – ve bacteria, Bacterial genome and plasmid, Endospore - formation, structure and function, Genetic Recombination (a) Transformation – with special emphasis on Natural and Induced competence and DNA uptake, (b) Conjugation─ F-factor, F + X F − , Hfr X F − , concept of F', chromosome mobilization, (c) Transduction– Generalised and specialized			

CORE COURSE 1 (PRACTICAL)

PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
ALGAE	Work out: (Free hand drawing and drawing under drawing prism with magnification): Oedogonium, Chara, Ectocarpus	RP	Demonstration, interaction, work out	6 hr
	Study of Permanent slides: *Gloeotrichia, Volvox, Vaucheria, Coleochaete, Polysiphonia*, Centric and Pennate diatom	RP	Demonstration	2 hr

	Study of Macroscopic specimens: *Laminaria, Sargassum*	RP	Demonstration	1 hr
MICROBIOLOGY	Preparation of bacterial media: Nutrient agar and nutrient broth, Preparation of slants and pouring Petri-plates	MM	Demonstration	3 hr
	Sub-culturing of bacterial culture	MM	Demonstration, experimental work	2 hr
	Gram staining from bacterial culture	MM	Demonstration, experimental work	3 hr
	Microscopic examination of bacteria from natural habitat (curd) by simple staining	MM	Demonstration, experimental work	3 hr
	Field work: for study and collection of algae (from natural habitat) conducted to give an introductory idea about plant diversity	MM, RP	Field visit	4 hr

CORE COURSE 2 (Theory)

MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR

MYCOLOGY	General Account: Hyphal forms, Fungal spore forms and mode of liberation, Sexual reproduction and degeneration of sex, Parasexuality and sexual compatibility, Life cycle patterns	RP	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Classification: Classification of Fungi (Ainsworth, 1973) upto sub-division with diagnostic characters and examples. General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Life history: Synchytrium, Rhizopus, Ascobolus, Agaricus	RP	Online teaching through Google meet, ppt, interactive discussion	6 hr
	Mycorrhiza: Types with salient features, Role in Agriculture & Forestry	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr

	Lichen: Types, Reproduction, Economic and ecological importance	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
PHYTO-PATHOLOGY	Terms and Definitions: Disease concept, Symptoms, Etiology & causal complex, Primary and secondary inocula, Infection, Pathogenecity and pathogenesis, Necrotroph and Biotroph, Koch's Postulates, Endemic, Epidemic, Pandemic and Sporadic disease, Disease triangle, Disease cycle (monocyclic, polycyclic and polyetic)	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Host – Parasite Interaction: Mechanism of infection (Brief idea about Pre-penetration, Penetration and Post-penetration), Pathotoxin (Definition,criteria and example), Defense mechanism with special reference to Phytoalexin, Resistance- Systemic acquired and Induced systemic.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Plant Disease Management: Quarantine, Chemical, Biological, Integrated	DS	Online teaching through Google meet, ppt,	3 hr

			interactive discussion	
	Symptoms, Causal organism, Disease cycle and Control measures: Late blight of Potato, Brown spot of rice, Black stem rust of wheat, Stem rot of jute.	DS	Online teaching through Google meet, ppt, interactive discussion	6 hr

CORE COURSE 2 (PRACTICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
MYCOLOGY	Work out: microscopic measurement of Reproductive structures): *Rhizopus* (asexual), *Ascobolus, Agaricus*	RP	Demonstration, work out	4 hr
	Study from permanent slides: Zygospore of Rhizopus, Conidia of Fusarium, Conidiophore of Penicillium	RP	Demonstration	1 hr
	Morphological study of Fungi: fruit body of Polyporus, Cyathus), Lichens (fruticose and foliose	RP	Demonstration	1 hr

PHYTO-PATHOLOGY	Preparation of fungal media (PDA)	DS	Demonstration, experimental work	2 hr
	Sterilization process.	DS	Demonstration, experimental work	2 hr
	Isolation of pathogen from diseased leaf.	DS	Demonstration, experimental work	1 hr
	Inoculation of fruit and subculturing.	DS	Demonstration, experimental work	2 hr
	Identification : Pathological specimens- Pathological specimens of Brown spot of rice, Bacterial blight of rice , Loose smut of wheat, Stem rot of jute, Late blight of potato; Slides of uredial, telial, pycnial & aecial stages of Puccinia gramini	DS	Demonstration, interactive discussion	3 hr
FIELD WORK	Study and collection of macrofungi	MM, DS	Field visit, demonstration	4 hr

SEMESTER- II (Theory)

CORE COURSE 3

PLANT ANATOMY (BOT-A-CC-2-3-TH)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
ANATOMY	Cell wall: Ultrastructure & Chemical constituents, Plasmodesmata- ultrastructure, Concept of Apoplast and Symplast, Growth and Thickening of cell wall	MM	Class lecture, power point presentation, interactive discussion	3 hr
	Stomata: Types (Metcalfe and Chalk, Stebbins and Khush)	MM	Class lecture, power point presentation, interactive discussion	1 hr
	Stele: Leaf-trace and leaf-gap, Stelar types & evolution	MM	Class lecture, power point presentation, interactive discussion	2 hr

	Primary structure of stem and root: - Monocot and Dicot. Leaf- dorsiventral and isobilateral	MM	Class lecture, power point presentation, interactive discussion	6 hr
	Secondary growth: Normal (intra- & extra-stelar), Anomalous (stem of *Bignonia*, *Boerhavia*, *Tecoma*, *Dracaena* and root of *Tinospora*)	MM	Class lecture, power point presentation, interactive discussion	5 hr
	Mechanical tissues and the Principles governing their distribution in plants	MM	Class lecture, power point presentation, interactive discussion	2 hr
	Developmental Anatomy: Organisation of shoot apex (Tunica–Corpus) and Root apex (Korper-Kappe), Plastochrone	MM	Class lecture, power point presentation, interactive discussion	2 hr

	Ecological Anatomy: Adaptive anatomical features of Hydrophytes, Xerophytes	MM	Class lecture, power point presentation, interactive discussion	2 hr
	Scope of plant anatomy: application in systematics, forensics and pharmacognosy	MM	Class lecture, power point presentation, interactive discussion	3 hr

SEMESTER- II (PRACTICAL)

CORE COURSE 3

PLANT ANATOMY (BOT-A-CC-2-3-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Microscopic studies	Microscopic studies on: Types of stomata, sclereids, raphides (Colocasia), cystolith (Ficus leaf) starch grains, aleurone grains, laticiferous ducts, oil glands	MM	Demonstration, experimental work	3 hr

Study of anatomical details from slides	Root: Monocot and dicot, b) Stem- Monocot and dicot, c) Leaf- Monocot and dicot	MM	Demonstration, experimental work	6 hr
Study of anomalous secondary structure	*Bignonia, Boerhaavia, Tecoma, Dracaena and root of Tinospora*	MM	Demonstration, experimental work	5 hr
Study of adaptive anatomical features	Hydrophytes (Nymphaea – petiole) and Xerophytes (Nerium – leaf)	MM	Demonstration, experimental work	1 hr

CORE COURSE 4 (THEORITICAL)

ARCHAEGONIATE (BOT-A-CC-2-4-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
BRYOPHYTES	General Account: General characteristics and adaptations to land habit, Classification (Strotler	RP	Class lecture, power point presentation,	4 hr

	and Crandle Strotler, 2009) up to class with diagnostic characters and examples		interactive discussion	
	Life History: Gametophyte structure and Reproduction, Development and Structure of sporophyte, Spore dispersal in: Marchantia, Anthoceros, Funaria.	RP	Class lecture, power point presentation, interactive discussion	4 hr
	Phylogeny: Unifying features of archaegoniates; transition to land habit, Origin of Alternation of Generations (Homologous and Antithetic theory), Evolution of Sporophytes (Progressive and Regressive concept), Origin of Bryophytes	RP	Class lecture, power point presentation, interactive discussion	4 hr
	Importance: Role of bryophytes in: Plant succession, Pollution Monitoring, Economic importance of bryophytes with special reference to Sphagnum	RP	Class lecture, power point presentation, interactive discussion	2 hr
PTERIDOPHYTES	General Account: Colonisation and rise of early land plants, Classification of vascular plants by Gifford & Foster (1989) upto division	DS	Class lecture, power point presentation,	2 hr

	(Rhyniophyta to Filicophyta) with diagnostic characters and examples		interactive discussion	
	Life History: Sporophyte structure, Reproduction and Structure of gametophyte in Psilotum, Selaginella, Equisetum, Pteris.	DS	Class lecture, power point presentation, interactive discussion	8 hr
	Telome concept and its significance in the origin of different groups of Pteridophytes	DS	Class lecture, power point presentation, interactive discussion	2 hr
	Heterospory and Origin of Seed habit	DS	Class lecture, power point presentation, interactive discussion	2 hr
	Economic importance as food, medicine and Agriculture	DS	Class lecture, power point presentation,	1 hr

			interactive discussion	
GYMNOSPERMS	Classification: Classification of vascular plants by Gifford & Foster (1989) upto division (Progymnospermophyta to Gnetophyta) with diagnostic characters and examples	RP	Class lecture, power point presentation, interactive discussion	3 hr
	Progymnosperms: Diagnostic characters of the group, Vegetative and reproductive features of Archeopteris, Phylogenetic importance	RP	Class lecture, power point presentation, interactive discussion	2 hr
	Life History: Distribution in India; Vegetative and Reproductive structure of sporophyte, Development of gametophyte in : Cycas , Pinus and Gnetum	RP	Class lecture, power point presentation, interactive discussion	2 hr
	Economic Importance with reference to Wood, Resins, Essential oils, and Drugs	RP	Class lecture, power point presentation,	2 hr

			interactive discussion	

CORE COURSE 4 (PRACTICAL)

ARCHAEGONIATE (BOT-A-CC-2-4-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
BRYOPHYTES	Morphological study: *Riccia, Porella*	DS	Demonstration, interactive discussion	1 hr
	Study from permanent slides: Riccia (V.S. of thallus with sporophyte), Marchantia (L.S. through gemma cup, antheridiophore , archegoniophore) , Anthoceros (L.S. of sporophyte) , Funaria (L.S. of capsule)	DS	Demonstration, interactive discussion	3 hr
PTERIDOPHYTES	Morphological study of the sporophytic plant body: Lycopodium, Ophioglossum and Marsilea	DS	Demonstration, interactive discussion	1 hr
	Workout of the reproductive structures: Selaginella, Equisetum, Pteris	DS	Demonstration, interactive	6 hr

			discussion, work out	
	Study from permanent slides: Psilotum (T.S. of synangium), Lycopodium (L.S. of strobilus), Ophioglossum (L.S. of spike), Dryopteris (gametophyte), Marsilea (L.S. of sporocarp).	DS	Demonstration, interactive discussion	2 hr
GYMNOSPERMS	Morphological study: Cycas (microsporophyll and megasporophyll), Pinus (female and male cone), Gnetum (female and male cone)	DS	Demonstration, interactive discussion	2 hr
	Study from permanent slides: Cycas (L.S. of ovule), Pinus (L.S. of male and female cone), Ginkgo (L.S. of female strobilus), Gnetum (L.S. of male cone and ovule)	DS	Demonstration, interactive discussion	2 hr
FIELD STUDY	Botanical excursion to familiarize the students with the natural habitats of Bryophyte, Pteridophyta and gymnosperms	DS, MM	Field visit, demonstration	4 hr

CORE COURSE-5 (THEORETICAL)

PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PALAEOBOTANY & PALYNOLOGY	Geological time scale with dominant plant groups through ages	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Plant Fossil: Types: Body fossil (Micro- and Megafossils), Trace fossil, Chemical fossil, Index fossil, Different modes of preservation (Schopf, 1975), Conditions favouring fossilization, Nomenclature and Reconstruction, Principle of fossil dating (a brief idea), Importance of fossil study	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
	Fossil Pteridophytes: Structural features, Geological distribution and Evolutionary significance of Rhynia, Lepidodendron (Reconstructed), Calamites (Reconstructed)	MM	Online teaching through Google meet, ppt,	6 hr

			interactive discussion	
	Fossil gymnosperms: Structural features and Geological distribution of reconstructed genera: Lyginopteris, Williamsonia, Cordaites	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Indian Gondwana System: Three fold division with major megafossil assemblages	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Palynology: Spore and Pollen, Pollen aperture types, NPC classification (Erdtman) Pollen wall Sporopollenin, Stratification and Ornamentation (sculpturing)	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Applied Palynology: Basic concepts of: Palaeopalynology, Aeropalynology, Forensic palynology, Melissopalynology	MM	Online teaching through Google meet, ppt,	4 hr

			interactive discussion	

CORE COURSE-5 (PRACTICAL)

PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-P)

CC-5	TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PALAEOBOTANY AND PALYNOLOGY	Morphological study: Ptilophyllum and Glossopteris leaf fossils	MM	Demonstration, interactive discussion	1 hr
	Study from permanent slides: T.S. of stem of *Rhynia*, *Lepidodendron*, *Calamites*, *Lyginopteris*, *Cordaites*	MM	Demonstration, interactive discussion	3 hr
	Study of Pollen types: (colpate from *Leonurus sibiricus*/ Brassica sp., porate from Hibiscus rosa-sinensis and colporate from *Cassia sophera*/ *C. tora*)	DS	Demonstration, interactive discussion, work out	2 hr

CORE COURCE- 6 (THEORETICAL)

REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
MORPHOLOGY OF ANGIOSPERMS	Inflorescence types with examples	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Flower, induction of flowering, flower development- genetic and molecular aspects	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Fruits and seeds types with examples	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
EMBRYOLOGY	Pre-fertilisation changes: Microsporogenesis and Microgametogenesis, Megasporogenesis and	DS	Online teaching through Google	6 hr

	Megagametogenesis (monosporic, bisporic and tetrasporic)		meet, ppt, interactive discussion	
	Fertilisation: Pollen germination, Pollen tube-growth, entry into ovule and discharge, Double fertilization	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Post-fertilization changes: Embryogenesis in Capsella, Development of Endosperm (3 types)	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Apomixis & Polyembryony: Apomixis- Apospory and Apogamy, Polyembryony- different types	DS	Online teaching through Google meet, ppt, interactive discussion	1 hr

CORE COURCE- 6 (PRACTICAL)

REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
REPRODUCTIVE BIOLOGY OF ANGIOSPERMS	Inflorescence types- study from fresh/ preserved specimens	DS	Demonstration, interactive discussion	2 hr
	Flowers- study of different types from fresh/ preserved specimens	DS	Demonstration, interactive discussion	2 hr
	Fruits- study from different types from fresh/preserved specimens	DS	Demonstration, interactive discussion	2 hr
	Study of ovules (permanent slides/ specimens/photographs)- types (anatropous, orthotropous, amphitropous and campylotropous)	DS	Demonstration, interactive discussion	1 hr
	Field work to give a comprehensive idea about different types of inflorescence, flowers and fruits	DS, MM	Demonstration	4 hr

CORE COURSE- 7 (THEORETICAL)

PLANT SYSTEMATICS (BOT-A-CC-3-7-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
TAXONOMY OF ANGIOSPERMS	Introduction: Components of Systematic: Nomenclature, Identification, Classification; Taxonomy and its phases - Pioneer, Consolidation, Biosystematic and Encyclopaedic; alpha- and omega- taxonomy	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Nomenclature: Type method, Publication, Rank of taxa, Rules of priority, Retention and rejection of names, Author Citation, Effective and valid publication, Elementary knowledge of ICN-Principles	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Systems of classification: Broad outline of Bentham & Hooker (1862-1883), Cronquist (1988), Takhatajan (1991) - system of classification with merits and demerits. Brief reference of angiosperm phylogeny group (APG III) classification. Systematics in Practice: Herbaria and Botanical Gardens – their role in teaching and research;	DS	Online teaching through Google meet, ppt, interactive discussion	8 hr

	important Herbaria and Botanical Gardens of India and world (3 each); Dichotomous keys – indented and bracketed			
	Phenetics and Cladistics: Brief idea on Phenetics, Numerical taxonomy- methods and significance; Cladistics- construction of dendrogram and primary analysis; Monophyletic, polyphyletic and paraphyletic groups; Plesiomorphy and apomorphy	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Data sources in Taxonomy: Supportive evidences from: Phytochemistry, Cytology, Palynology and Molecular biology data (Protein and Nucleic acid homology)	RP	Online teaching through Google meet, ppt, interactive discussion	6 hr
	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses): Monocotyledons- Alismataceae, Gramineae (Poaceae), Cyperaceae, Palmae (Arecaceae), Liliaceae, Musaceae, Zingiberaceae, Cannaceae, Orchidaceae	RP	Online teaching through Google meet, ppt, interactive discussion	6 hr

	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses): Dicotyledons- Nymphaeaceae, Magnoliaceae, Leguminosae (subfamilies), Polygonaceae, Euphorbiaceae, Malvaceae, Umbelliferae (Apiaceae), Labiatae (Lamiaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Rubiaceae, Cucurbitaceae, Compositae (Asteraceae).	DS	Online teaching through Google meet, ppt, interactive discussion	6 hr

CORE COURSE- 7 (PRACTICAL)

PLANT SYSTEMATICS (BOT-A-CC-3-7-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
ANGIOSPERMS	Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum Hooker system of classification from the following families:	DS	Demonstration, interactive discussion	10 hr

	Malvaceae, Fabaceae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.			
	Spot identification: (Binomial, Family) of common wild plants	DS	Demonstration, interactive discussion	3 hr
FIELD WORK	Three excursions and Herbarium specimen preparations: Acharya Jagadish Chandra Bose Indian Botanic Garden (Shibpur, Howrah) and Central National Herbarium (CNH)	DS, MM	demonstration	4 hr

SKILL ENHANCEMENT COURSE- ELECTIVE (SEC) SEC-A

BIOFERTILIZERS (BOT-A-SEC-A-3-2) (THEORETICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
GENERAL ACCOUNT ABOUT THE MICROBES	Isolation, identification, mass multiplication, carrier based inoculants, actinorrhizal symbiosis.	MM	Online teaching through Google meet, ppt,	3 hr

USED AS BIOFERTILIZERS, RHIZOBIUM			interactive discussion	
AZOSPIRILLUM	Isolation and mass multiplication- carrier based inoculants, associative effect of different microorganisms.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
AZOTOBACTER	Classification, characteristics- crop response to Azetobacter inoculants, maintenance and mass multiplication.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
CYANOBACTERIA (BLUE GREEN ALGAE)	Azolla and Anabaena azollae association, nitrogen fixation. Factors affecting growth, blue green algae and Azolla in rice cultivation.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
MYCORRHIZAL ASSOCIATION	Types of mycorrhizal association, phosphorus nutrition, growth and yield- colonisation of VAM –	RP	Online teaching through Google meet, ppt,	3 hr

	isolation and inoculum production of VAM and its influence on growth and yield of crop plants.		interactive discussion	
ORGANIC FARMING	Green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and industrial wastes- biocompost making methods, types and methods of vermicomposting- field application.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr

SEMESTER IV

CORE COURSE-8 (THEORETICAL)

PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT GEOGRAPHY	Phytogeographical regions: Phytogeographical regions of India (Chatterjee 1960); Dominant flora of Eastern Himalaya, Western Himalaya and Sundarban.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr

	Endemism: Endemic types and Factors; Age & Area hypothesis and Epibiotic theory; Endemism in Indian flora	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
ECOLOGY	Preliminary idea on: Habitat and Niche, Ecotone and edge–effect, Microclimate, Ecads, ecotype and ecoclines, Carrying capacity.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Community ecology: Community- Characteristics and diversity, Ecological succession –Primary and secondary, Seral stages (with reference to Hydrosere), autogenic and allogenic succession.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Plant indicators (metallophytes); Phytoremediation	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr

	Conservation of Biodiversity: Level of Biodiversity: genetic, species & ecosystem diversity, Biodiversity hot spots- criteria, Indian hotspots, In- situ and ex-situ conservation, Seed-banks, Cryopreservation	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
EVOLUTION	Introduction: Theories of evolution: Natural selection, Group selection, Neutral theory of molecular evolution, Phyletic gradualism, Punctuated equilibrium and Stasis	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Brief idea on: Stabilizing directional, disruptive and sexual selection; Speciation: Sympatric and allopatric speciation; Coevolution, Adaptive radiation, Reproductive isolation	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Simplified phylogeny of bacteria, algae, fungi, bryophyte, pteridophyte and gymnosperm, Phylogenetic tree	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr

CORE COURSE-8 (PRACTICAL)

PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT GEOGRAPHY	Field work: long excursion at different phytogeographical region of India, Study of local flora	DS	Demonstration, interactive discussion	4 hr
ECOLOGY	Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components	DS	Demonstration, interactive discussion	2 hr
	Comparative anatomical studies of leaves form polluted and less polluted areas	DS	Demonstration, interactive discussion	1 hr
	Measurement of dissolved O_2 by azide modification of Winkler's method	DS	Demonstration, interactive discussion	2 hr
	Comparison of free CO_2 from different sources	DS	Demonstration, interactive discussion	2 hr

CORE COURSE- 9 (THEORETICAL)

ECONOMIC BOTANY (BOT-A-CC-4-9-TH)

CC-2	TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
ECONOMIC BOTANY	Origin of cultivated crops: Concepts of centre of origin, their importance with reference to Vavilov's work. Examples of major plant introductions; crop domestication and loss of genetic diversity; evolution of new crops/ varieties, importance of germplasm diversity.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Cereals: Rice and wheat (origin, morphology, processing and uses).	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Legumes: Origin, morphology and uses of gram and mung bean. Importance to man and environment.	RP	Online teaching through Google meet, ppt,	2 hr

			interactive discussion	
	Sugar and starches: Morphology and processing of sugarcane, products and byproducts of sugarcane industry. Potato- morphology, propagation and uses.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Spices: Listing of important spices, their family and part used.	RP	Online teaching through Google meet, ppt, interactive discussion	1 hr
	Beverages: Tea (morphology, processing and uses).	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Oil and fats: General description, classification, extraction, their uses and health implications of mustard, soybean, coconut (Botanical name, family	DS	Online teaching through Google meet, ppt,	3 hr

	and uses). Essential oils- general account, extraction methods, comparison with fatty oils and their uses.		interactive discussion	
	Drug-yielding plants: Therapeutic and habit forming drugs with special reference to Cinchona, Digitalis, Papavar, Cannabis and Tobacco (morphology, processing, uses and health hazards).	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Timber: general account with special reference to Sal and Teak.	DS	Class lecture, power point presentation, interactive discussion	2 hr
	Fibers: Cotton and Jute (Morphology, extraction and uses).	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr

CORE COURSE- 9 (PRACTICAL)

ECONOMIC BOTANY (BOT-A-CC-4-9-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
ECONOMIC BOTANY	Cereals: Wheat (habit sketch, L.S./T.S. of grain, starch grains, micro-chemical tests); rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests)	DS	Demonstration, interactive discussion	3 hr
	Legume: Soybean, ground nut (habit, fruit, seed structure, micro-chemical tests)	DS	Demonstration, interactive discussion	2 hr
	Source of sugars and starches: Sugarcane (habit sketch; cane juice- micro-chemical tests); potato (habit sketch, tuber morphology, T.S. of tuber to show localization of starch grains, W.M. of starch grains, micro-chemical tests.	DS	Demonstration, interactive discussion	3 hr
	Tea- tea leaves, tests for tannin:	DS	Demonstration, interactive discussion	2 hr

	Mustard- plant specimen, seeds, tests for fat in crushed seeds	DS	Demonstration, interactive discussion	2 hr
	Habit- Digitalis, Papaver and Cannabis	DS	Demonstration, interactive discussion	1 hr
	Sal, Teak- section of young stem	DS	Demonstration, interactive discussion	2 hr
	Jute- specimen, transverse section of stem, tests for lignin on T.S. of stem and study of fibre following maceration technique	DS	Demonstration, interactive discussion	2 hr

CORE COURSE 10 (THEORETICAL)

GENETICS (BOT-A-CC-4-10-TH)

CC-2	TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
GENETICS	Introduction: Mendelian genetics and its extension	MM	Online teaching through Google	2 hr

			meet, ppt, interactive discussion	
	Linkage, Crossing over and Gene Mapping: Complete and incomplete linkage (example), linked gene does not assort independently (example), linkage group, Crossing over, crossing over produces recombination (example), detection of crossing over (McClintock's experiment), and Molecular mechanism of crossing over (Holliday model), Gene mapping with three point test cross, detection of middle gene in three point test cross, calculation of recombination frequencies, Co-efficient of coincidence and interference, mapping function, Problems on gene mapping, Molecular mapping – ISH, FISH (brief idea).	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
	Epistasis and Polygenic inheritance in plants	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

	Aneuploidy and Polyploidy: Types, examples, meiotic behaviour and importance of: Aneuploidy,. Polyploidy, Speciation and evolution through polyploidy.	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Chromosomal aberration: Types and meiotic behaviour of: Deletion, Duplication, Translocation and. Inversion.	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
	Mutation: Point mutation-Transition, Transversion and Frame shift mutation, Molecular mechanisms (tautomerisation, alkylation, deamination, base analogue incorporation, dimerisation), DNA repair (brief idea).	MM	Online teaching through Google meet, ppt, interactive discussion	6 hr
	Structural organisation of Gene: One Gene–one polypeptide concept, Split gene, Overlapping gene, Repetitive DNAtandem and interspersed, Transposon (Ac-Ds system), Homoeotic gene in plants (ABCE Quartet model of flowering).	MM	Online teaching through Google meet, ppt, interactive discussion	8 hr

CORE COURSE 10 (PRACTICAL)

GENETICS (BOT-A-CC-4-10-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
GENETICS	Introduction to chromosome preparation: Pre-treatment, Fixation, Staining, Squash and Smear preparation, Preparation of permanent slides.	MM	Demonstration, interactive discussion	3 hr
	Determination of mitotic index and frequency of different mitotic stages in pre-fixed root tips of Allium cepa.	MM	Demonstration, interactive discussion	4 hr
	Study of mitotic chromosome: Study of mitotic chromosome: Metaphase chromosome preparation, free hand drawing under high power objective, drawing with drawing prism under oil immersion lens, determination of 2n number, and comment on chromosome morphology of the following specimens from root tips: Allium cepa, Aloe vera, Lens esculenta.	MM	Demonstration, interactive discussion	3 hr

	Study of chromosomal aberrations developed due to exposure to any two pollutants/ pesticides etc	MM	Demonstration, interactive discussion	2 hr
	Study of meiotic chromosome: Smear preparation of meiotic cells, identification of different stages and free hand drawing of the following specimens from flower buds: Allium cepa and Setcreasea sp.	MM	Demonstration, interactive discussion	3 hr
	Identification from permanent slides : Meiosis – (i) normal stages (ii) abnormal stages – laggard, anaphase bridge, ring chromosome (Rhoeo discolor); Mitosis – (i) normal stages, (ii) abnormal stagesearly separation, late separation, multipolarity, sticky bridge, laggard, fragmentation, (ii) pollen mitosis.	MM	Demonstration, interactive discussion	3 hr

SKILL ENHANCEMENT COURSE- ELECTIVE (SEC) SEC-B

MUSHROOM CULTURE TECHNOLOGY (BOT-A-SEC-B-4-4) THEORETICAL

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
INTRODUCTION	Nutritional and medicinal value of edible mushrooms; poisonous mushrooms, types of edible	MM	Online teaching through Google	2 hr

	mushrooms available in India- Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus.		meet, ppt, interactive discussion	
CULTIVATION TECHNOLOGY	Infrastructure: substrates (locally available), polythene bags, vessels, inoculation hook, inoculation loop, low cost stoves, sieves, culture racks, mushroom unit (thatched house), water sprayer, tray, small polythene bag. Pure culture: medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation- paddy straw, sugarcane trash, maize straw, banana leaves,. Factors affecting the mushroom bed preparation- low cost technology, composting technology in mushroom production.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
STORAGE AND NUTRITION	Short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickels, papads), drying, storage in salt solutions. Nutrition- proteins- amino acids, mineral elements nutrition- carbohydrates, crude fibre content- vitamins	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
FOOD PREPARATION	Type of foods prepared from mushroom. Research centres- National level and regional level. Cost	RP	Class lecture, power point	3 hr

	benefit ratio- marketing in India and abroad. Export value.		presentation, interactive discussion	

SEMESTER V

CORE COURSE- 11 (THEORETICAL)

CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
CELL BIOLOGY	Origin and Evolution of Cells: Evolution of nucleic acid (from PNA to DNA), Concept of RNA world, Ribozymes, First cell, 1.2. Origin of eukaryotic cell (endosymbiotic theory), 1.3. Small RNA- riboswitch, RNA interference, si RNA, mi RNA- brief idea, Organellar DNA (cp- and mt- DNA).	RP	Online teaching through Google meet, ppt, interactive discussion	6 hr
	Nucleus and Chromosome: Nuclear envelope, Nuclear lamina and Nuclear pore complex, 2.2. Nucleolus- ultrastructure and ribosome biogenesis, 2.3. Chromatin ultrastructure and DNA packaging in	MM	Online teaching through Google meet, ppt,	4 hr

	eukaryotic chromosome, 2.4. Centromere: types, structure and function.		interactive discussion	
	Cell cycle and its regulation: Kinetochore and spindle apparatus-structural organization and functions, Microtubulesstructure, organization and function, Mechanism of cell cycle control in Yeast (checkpoints and role of MPF), Apoptosis (Brief idea).	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
MOLECULAR BIOLOGY	DNA Replication, Transcription and Translation (Prokaryotes & Eukaryotes): Central Dogma, Semiconservative DNA replication – mechanism, enzymes involved in DNA replication- DNA polymerase, DNA gyrase, Helicase, Ligase, primase and other accessory proteins, Eukaryotic replication with special reference to replication licensing factor, assembly of new nucleosome, replication at the end chromosome telomere, telomerase concept, Fidelity of DNA replication- prokaryote: nucleotide selection, proof reading, mismatch repair; eukaryote: through selection of error prone DNA polymerase, Transcription, RNA processing, Aminoacylation of tRNA, Translation.	MM	Online teaching through Google meet, ppt, interactive discussion	12 hr

	Gene Regulation: Concept of Lac-operon, Positive and negative control.	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Genetic Code: Properties-evidences & exceptions, Decipherence of codon (Binding technique).	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Recombinant DNA Technology: Restriction endonuclease, - types and roles, Vector (plasmid pBR 322), Marker gene, Steps of cloning technique, PCR and its application, Genomic DNA and cDNA library.	MM	Online teaching through Google meet, ppt, interactive discussion	6 hr
	Development and causes of Cancer, tumor suppressor gene and oncogene	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

CORE COURSE- 11 (PRACTICAL)

CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
CELL BIOLOGY	Study of plant cell structure with the help of epidermal peal mount of Onion/Rhoeo/Crinum	MM	Demonstration, interactive discussion	3 hr
	Measurement of cell size by the technique of micrometry	MM	Demonstration, interactive discussion	2 hr
	Counting cells per unit volume with the help of haemocytometer (Yeast/ pollengrains)	MM	Demonstration, interactive discussion	2 hr
	Cytochemical staining of DNA- Pyronine-methyl green staining	MM	Demonstration, interactive discussion	4 hr
	Estimation of DNA content through DPA staining.	MM	Demonstration, interactive discussion	3 hr

	Estimation of RNA through orcinol method.	MM	Demonstration, interactive discussion	3 hr
	Study of nucleolus through hematoxylin/ orcin staining and determination of nucleolar frequency	MM	Demonstration, interactive discussion	3 hr
	Preparation of models/ charts: rolling circle, theta replication, semi-discontinuous replication, prokaryotic RNA polymerase and eukaryotic RNA polymerase II, assembly of spliceosome mechinary, splicing mechanism in group I and group II introns, ribozyme and alternative splicing.	MM	Demonstration, interactive discussion	4 hr

CORE COURSE- 12 (THEORETICAL)

BIOCHEMISTRY (BOT-A-CC-5-12-TH)

CC-2	TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
BIOCHEMISTRY	Biochemical Foundations: Covalent and non-covalent bonds; hydrogen bond; Van der Waal's forces; 1.2. Structure and properties of water; 1.3.	RP	Online teaching through Google meet, ppt,	4 hr

	pH and buffer (inorganic and organic); 1.4. Handerson-Hasselbalch equation; 1.5. Isoelectric point.		interactive discussion	
	Molecules of life: Nucleic Acids – structure of nucleosides and nucleotides ; oligo- and poly nucleotides , B & Z form of DNA, RNA- different forms; nucleotide derivatives (ATP, NADP), Proteins – structure and classification of amino acids; primary, secondary, tertiary and quaternary structure of proteins; Carbohydrates - structure of mono-, di- and polysaccharide; stereoisomers, enantiomers and epimers; Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Energy flow and enzymology: Bioenergetics- Thermodynamic principles; free energy; energy rich bonds- phosphoryl group transfer and ATP; redox potentials and Biological redox reactions, Enzymes – classification and nomenclature (IUBMB); Co-factors and co-enzymes; isozymes,	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr

	Mechanism of enzyme action; enzyme inhibition; Enzyme kinetics (Michaelis- Menten equation) and simple problems.			
	Cell membrane: Membrane chemistry, Membrane transport (uniport, symport, antiport), mechanism of ion uptake.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Phosphorylation: ATP Synthesis- Chemiosmotic model, Oxidative and Photophosphorylation, Mechanism and differences.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr

CORE COURSE- 12 (PRACTICAL)

BIOCHEMISTRY (BOT-A-CC-5-12-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT BIOCHEMISTRY- Qualitative	Detection of organic acids: citric, tartaric, oxalic and malic from laboratory samples	DS	Demonstration, interactive discussion	4 hr
	Detection of carbohydrate and protein from plant samples	DS	Demonstration, interactive discussion	3 hr
	Detection of the nature of carbohydrate – glucose, fructose , sucrose and starch from laboratory Samples	DS	Demonstration, interactive discussion	5 hr
	Detection of Ca, Mg, Fe, S from plant ash sample	DS	Demonstration, interactive discussion	2 hr
PLANT BIOCHEMISTRY- Quantitative	Preparation of solutions and buffers	DS	Demonstration, interactive discussion	2 hr

	Estimation of amino-nitrogen by formol titration method (glycine)	DS	Demonstration, interactive discussion	2 hr
	Estimation of glucose by Benedicts quantitative reagent	DS	Demonstration, interactive discussion	2 hr
	Estimation of titratable acidity from lemon	DS	Demonstration, interactive discussion	2 hr
	Estimation of catalase activity in plant samples and effect of substrate, enzyme concentration and pH on enzyme activity	DS	Demonstration, interactive discussion	2 hr
	Estimation of urease activity in plant samples	DS	Demonstration, interactive discussion	2 hr
	Colorimetric estimation of protein by Folin phenol reagent	DS	Demonstration, interactive discussion	4 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-A

BIOSTATISTICS (BOT-A-DSE-A-5-1-TH) THEORETICAL

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
BIOSTATISTICS	Definition, statistical methods, basic principles, variables- measurements, functions, limitations and uses of statistics.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
BIOMETRY	Data, Sample, Population, Random sampling, Frequency distribution- definition only.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
CENTRAL TENDENCY	Arithmetic Mean, Mode and Median; Measurement of dispersion–Coefficient of variation, Standard Deviation, Standard error of Mean.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr

TEST OF SIGNIFICANCE	Chi- square test for goodness of fit.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
PROBABILITY	Multiplicative and additive rules of probability: application and importance.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
MEASUREMENT OF GENE FREQUENCY	Hardy-Weinberg equilibrium- conditions applied for its implications (simple problems to calculate genotypic and allelic frequencies).	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-A

BIOSTATISTICS (BOT-A-DSE-A-5-1-P) (PRACTICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
BIOSTATISTICS	Univariate analysis of statistical data: Statistical tables, mean, mode, median, standard deviation and standard error (using seedling population / leaflet size).	DS	Demonstration, interactive discussion	3 hr
	Calculation of correlation coefficient values and finding out the probability	DS	Demonstration, interactive discussion	2 hr
	Determination of goodness of fit in Mendellian and modified mono-and dihybrid ratios (3:1, 1:1, 9:3:3:1, 1:1:1:1, 9:7, 13:3, 15:1) by Chi-square analysis and comment on the nature of inheritance	DS	Demonstration, interactive discussion	8 hr
	Calculation of ‘F’ value and finding out the probability value for the F value	DS	Demonstration, interactive discussion	1 hr

	Basic idea of computer programme for statistical analysis of correlation coefficient,'t' test, standard error, standard deviation.	DS	Demonstration, interactive discussion	2 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-B

PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-TH) (THEORETICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Plant tissue culture – Introduction:	Basic concept and milestones, 1.2. Cellular totipotency, 1.3. Tissue culture media, 1.4. Aseptic manipulation, 1.5. Cyto-differentiation and dedifferentiation.	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
Callus culture	Callus induction, maintenance and application, 2.2. Suspension culture- introductory idea.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

Plant regeneration	.Organogenesis (direct and indirect), 3.2. Somatic embryogenesis, 3.3. Significance of organogenesis and somatic embryogenesis, 3.4. Artificial seed.	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
Haploid Culture	Anther and Pollen culture methods, Applications.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
Protoplast Culture	Protoplast isolation and culture, Protoplast fusion (somatic hybridization), Significance.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
Plant Genetic Engineering	Brief concept of different gene transfer methods, special emphasis on Agrobacterium mediated gene transfer, Role of Reporter gene, Achievements in crop biotechnology, environment and industry (suitable example)- pest resistant plants (BT cotton), herbicide resistance, disease and stress tolerance,	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr

	transgenic crop with improved quality (flavr tomato, golden rice), role of transgenic in population degradation (super-bug), leaching of minerals, production of industrial enzymes, oil, edible vaccine.			

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-B

PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-P) (PRACTICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT BIOTECHNOLOGY	Familiarization of basic equipments in plant tissue culture	MM	Demonstration, interactive discussion	3 hr
	Study through photographs/ charts/ models of anther culture, somatic embyogenesis, endosperm and embryo culture, micropropagation	MM	Demonstration, interactive discussion	6 hr
	Preparation of basal media. Sterilization techniques	MM	Demonstration, interactive discussion	5 hr

	Demonstration of any tissue culture technique during visit in a plant tissue culture lab	MM	Demonstration, interactive discussion	3 hr

SEMESTER VI

CORE COURSE-13 (THEORETICAL)

PLANT PHYSIOLOGY (BOT-A-CC-6-13-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT PHYSIOLOGY	Plant-water relations: Concept of water potential, components of water potential in plant system, Soil-plantAtmosphere continuum concept, Cavitation in xylem and embolism, Stomatal physiologymechanism of opening and closing, Role of carbon di-oxide, potassium ion, abscisic acid and blue light in stomatal movement, Antitranspirants.	RP	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Mineral nutrition: Essential and beneficial elements, macro- and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral	DS	Online teaching through Google meet, ppt,	2 hr

	deficiency symptoms, roles of essential elements, chelating agents.		interactive discussion	
	Organic Translocation: Phloem sap, P-protein, Phloem loading and unloading, Mass-flow (pressure flow) hypothesis and its critical evaluation.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Plant Growth Regulators: Physiological roles of Auxin, Gibberellin, Cytokinin, Abscisic acid, Ethylene, Chemical nature – IAA, GA_3, Kinetin, Biosynthesis and bioassay of IAA, Mode of action of IAA, Brassinosteroids and Polyamines as PGRs (brief idea).	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Photomorphogenesis: Concept of photomorphogenesis, Photoperiodism and plant types, Perception of photoperiodic stimulus, Critical day length, concept of light monitoring, Phytochrome, cryptochrome and phototropins-chemical nature and role in photomorphogenesis, Role of GA in flowering, Vernalisation – role of low	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr

	temperature in flowering, Concept of biological clock and biorhythm.			
	Seed dormancy: Types, Causes and Methods of breaking seed dormancy, Biochemistry of seed germination.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Physiology of Senescence and Ageing	DS	Online teaching through Google meet, ppt, interactive discussion	1 hr

CORE COURSE-13 (PRACTICAL)

PLANT PHYSIOLOGY PLANT PHYSIOLOGY (BOT-A-CC-6-13-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT PHYSIOLOGY	Determination of loss of water per stoma per hour.	DS	Demonstration, interactive discussion	2 hr
	Relationship between transpiration and evaporation.	DS	Demonstration, interactive discussion	2 hr
	Measurement of osmotic pressure of storage tissue by weighing method.	DS	Demonstration, interactive discussion	2 hr
	Measurement of osmotic pressure of Rhoeo leaf by plasmolytic method.	DS	Demonstration, interactive discussion	2 hr
	Effect of temperature on absorption of water by storage tissue and determination of Q10.	DS	Demonstration, interactive discussion	2 hr

	Rate of imbibition of water by starchy, proteinaceous and fatty seeds and effect of seed coat.	DS	Demonstration, interactive discussion	2 hr
	To study the phenomenon of seed germination (effect of light).	DS	Demonstration, interactive discussion	2 hr
	To study the induction of amylase activity in germinating grains.	DS	Demonstration, interactive discussion	2 hr
	To study the effect of different concentrations of IAA on Avena coleopotile elongation (IAA bioassay)	DS	Demonstration, interactive discussion	2 hr

CORE COURSE 14 (THEORETICAL)

PLANT METABOLISM (BOT-A-CC-6-14-TH)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT METABOLISM	Concept of metabolism: Introduction, Anabolic and catabolic metabolic pathways, regulation of	MM	Online teaching through Google	3 hr

	metabolism, role of regulatory enzymes (allosteric, covalent modulation and isozymes)		meet, ppt, interactive discussion	
	Photosynthesis: Chemical structure of chlorophyll a and b, absorption and action spectra, biological significance of carotenoid pigments, Red drop and Emerson effect, Components of photosystems (light harvesting complex), photochemical reaction centres, Cyclic and noncyclic electron transport, Water splitting mechanism, Calvin cycle – Biochemical reactions & stoichiometry, HSK Pathway– three variants of the pathway, Photosynthetic efficiency of C3 and C4 plants and crop productivity, Photorespiration – mechanism and significance, Crassulacean Acid Metabolism– mechanism and ecological significance.	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
	Respiration: EMP pathway, regulation and its anabolic role, Conversion of Pyruvic acid to Acetyl CoA, TCA-cycle and its amphibolic role, Oxidative pentose phosphate pathway and its significance, Mitochondrial electron transport system, uncouplers,	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr

	Oxidation of cytosolic $NADH^{+}H^{+}$, Stoichiometry of glucose oxidation (aerobic).			
	Nitrogen Metabolism: Assimilation of nitrate by plants, Biochemistry of dinitrogen fixation in Rhizobium, General principle of amino acid biosynthesis (including GS and GOGAT enzyme system).	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Lipid metabolism: synthesis and breakdown of triglycerides, ß-oxidation, glyoxalate cycle, gluconeogenesis and its role in mobilization of the lipids during seed germinbations, α- oxidation	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Mechanism of signal transduction: Mechanism of signal transduction: receptor-ligand interactions, second messenger concept, calcium-calmodilin, G protein, MAP-kinase cascade.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

CORE COURSE 14 (PRACTICAL)

PLANT METABOLISM (BOT-A-CC-6-14-P)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
PLANT METABOLISM	A basic idea of chromatography	MM	Demonstration, interactive discussion	2 hr
	Separation of plastidial pigments by solvent and paper chromatography	MM	Demonstration, interactive discussion	3 hr
	Estimation of total chlorophyll content from different chronologically aged leaves (young, mature and senescence) by Arnon method	MM	Demonstration, interactive discussion	3 hr
	Effect of HCO_3 concentration on oxygen evolution during photosynthesis in an aquatic plant and to find out the optimum and toxic concentration (either by volume measurement or bubble counting)	MM	Demonstration, interactive discussion	3 hr

	Measurement of oxygen uptake by respiring tissue (per g/hr.)	MM	Demonstration, interactive discussion	2 hr
	Determination of the RQ of germinating seeds.	MM	Demonstration, interactive discussion	2 hr
	Test of seed viability by TTC method.	MM	Demonstration, interactive discussion	3 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-A

MEDICINAL AND ETHNOBOTANY (BOT-A-DSE-A-6-3-TH) THEORETICAL

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Medicinal botany	History, scope and importance of medicinal plant, a brief idea about indigenous medicinal sciences- ayurveda, siddha and unani. Polyherbal formulations.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr

Pharmacognosy	Pharmacognosy and its importance in modern medicine, Crude drugs, Classification of drugs- chemical and pharmacological, Drug evaluation– organoleptic, microscopic, chemical, physical and biological, Major pharmacological groups of plant drugs and their uses.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
Secondary metabolites	Definition of secondary metabolites and difference with primary metabolites , Interrelationship of basic metabolic pathways with secondary metabolite biosynthesis (outlines only), Major types–terpenoids, phenolics, flavonoids, alkaloids and their protective action against pathogenic microbes and herbivores.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Pharmacologically active constituents	Source plants (one example) parts used and uses of: Steroids (Solasodin, Diosgenin, Digitoxin), Tannin (Catechin), Resins (Gingerol, Curcuminoids), Alkaloids (Quinine, Atropine. Pilocarpine, Strychnine, Reserpine, Vinblastine), Phenols (Sennocide and Capsaicin).	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
Ethnobotany and folk medicine	Definition, methods of study, application, Indian scenario, national interacts, Palaeo-ethnobotany, folk medicines in ethnobotany, ethnomedicine,	DS	Online teaching through Google meet, ppt,	3 hr

	ethnoecology, ethnic communities of India, application of natural products to certain diseasesJaudice, cardiac, infertility, diabetics, blood pressure and skin diseases		interactive discussion	

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-A

MEDICINAL AND ETHNOBOTANY (BOT-A-DSE-A-6-3-P) (PRACTICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
CHEMICAL TESTS	Tannin (Camellia sinensis / Terminalia chebula), (b) Alkaloid (Catharanthus roseus)	DS	Demonstration, interactive discussion	3 hr
POWDER MICROSCOPY	Zingiber and Holarrhena	DS	Demonstration, interactive discussion	2 hr
HISTOCHEMICAL TESTS	Curcumin (Curcuma longa), Starch in non-lignified vessel (Zingiber), Alkaloid (stem of Catharanthus and bark of Holarrhena).	DS	Demonstration, interactive discussion	3 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-B

Natural resource management (BOT-A-DSE-B-6-8-TH) THEORETICAL

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Natural resources	Definition and types	MM	Online teaching through Google meet, ppt, interactive discussion	1 hr
Sustainable utilization	Concept, approaches (economic, ecological and socio-cultural).	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
Land	Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

Water	Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
Biological Resources	Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan).	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
Forests	Definition, Cover and its significance (with special reference to India); Major and minor Forest products; Depletion; Management.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
Energy	Renewable and non-renewable sources of energy.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr

Contemporary practices in resource management	EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
National and international efforts	National and international efforts in resource management and conservation	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr

DISCIPLINE SPECIFIC ELECTIVE COURSES DSE-B

Natural resource management (BOT-A-DSE-B-6-8-P)

(PRACTICAL)

TOPIC	SUB-TOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Natural resource management	Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.	MM	Online teaching through Google meet, ppt,	3 hr

			interactive discussion	
	Estimation of foliar dust deposition.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Determination of total solid in water (TDS)	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Determination of chemical properties of soil by rapid spot test (carbonate, iron, nitrate)	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Estimation of organic carbon percentage present in soil sample	MM	Online teaching through Google meet, ppt,	3 hr

			interactive discussion	
	Collection of data on forest cover of specific area	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr

DEPARTMENT OF BOTANY

TEACHING PLAN FOR GENERAL COURSE (UNDER CBCS SYSTEM)

ACADEMIC SESSION 2018-19

SEMESTER-I GENERAL

PLANT DIVERSITY I
(BOT-G-CC-1-1-TH)

(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Introduction	Introduction to different plant groups	DS	Class lecture, power point presentation, interactive discussion	2 hr
Phycology	Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae, Classification: Criteria and system of Fritsch, Life histories of *Chlamydomonas*, *Chara* and *Ectocarpus*, Role of algae in the environment,	RP	Class lecture, power point presentation,	5 hr

	agriculture, biotechnology and industry.		interactive discussion	
Mycology	Diagnostic characters and examples of Oomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina (Ainsworth, 1973). Life histories of *Rhizopus* and *Ascobolus*, Economic importance of fungi, Fungal symbioses: *Mycorrhiza*, Lichen and their importance.	RP	Class lecture, power point presentation, interactive discussion	6 hr
Phytopathology	Symptoms - necrotic, hypoplastic and hyperplastic, Koch's postulates, Biotrophs and Necrotrophs, Disease triangle, Pathotoxins and phytoalexins (brief concept), Symptoms, causal organism, disease cycle and control measures of plant diseases (Late blight of potato, Brown spot of Rice, Stem rot of jute).	MM	Class lecture, power point presentation, interactive discussion	5 hr
Bryophytes	Unifying features of archaegoniates and transition to land habit, Amphibian nature of bryophytes, Diagnostic characters and examples of Hepaticopsida, Anthocerotopsida and Bryopsida (Proskauer 1957), Life histories of *Marchantia* and *Funaria*, Ecological and economic importance.	DS	Class lecture, power point presentation, interactive discussion	6 hr
Anatomy	Stomata - Types (Metcalfe & Chalk), Anatomy of root, stem and leaf of monocots and dicots, Stelar types and evolution, Secondary growth – normal in dicot stem and anomaly in stem of *Tecoma* & *Dracaena*	DS	Class lecture, power point presentation,	6 hr

			interactive discussion	

SEMESTER-I GENERAL

PLANT DIVERSITY I (PRACTICAL)
(BOT-G-CC-1-1-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Work out	Microscopic preparation, drawing and labeling of *Chlamydomonas*, *Chara*, *Ectocarpus*, *Rhizopus* and *Ascobolus*-	BP	Demonstration, interactive discussion	5 hr
Anatomical studies	Stem- *Cucurbita*, sunflower and maize. Root- *Colocassia*, gram and orchid. Leaf- Nerium	BP	Demonstration, interactive discussion	6 hr
Identification	Cryptogamic specimens (macroscopic/microscopic as prescribed in the theoretical syllabus. Pathological specimens (herbarium sheets) of Late blight of potato, Brown spot of rice and stem rot of jute.	BP	Demonstration, interactive discussion	3 hr

Excursion/ field work	Study of plant diversity, habitat of algae and fungi	BP	Demonstration, interactive discussion	4 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (BOT-G-CC-2-2-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Pteridophytes	Diagnostic characters and examples of Psilophyta, Lycophyta, Sphenophyta & Filicophyta (Gifford & Foster 1989). Life histories of *Selaginella* and *Pteris*, Economic importance.	DS	Class lecture, power point presentation, interactive discussion	5 hr
Gymnosperms	Progymnosperms (brief idea), Diagnostic characters and examples of Cycadophyta, Coniferophyta and Gnetophyta (Gifford & Foster 1989), Life histories of Cycas and Pinus, Williamsonia (reconstructed), Economic importance of Gymnosperms.	DS	Class lecture, power point presentation, interactive discussion	5 hr

Paleobotany & Palynology	Fossil, fossilization process and factors of fossilization, Importance of fossil study. Geological time scale, Palynology - Definition, spore & pollen (brief idea), Applications.	MM	Class lecture, power point presentation, interactive discussion	5 hr
Angiosperm Morphology	Inflorescence types with examples, Flower, Fruits and seeds- type and examples.	RP	Class lecture, power point presentation, interactive discussion	5 hr
Taxonomy of Angiosperms	Artificial, Natural and Phylogenetic systems of c1assificaiton with one example each, Diagnostic features of following families- Malvaceae, Leguminosae (Fabaceae), Cucurbitaceae, Rubiaceae, Compositae (Asteraceae), Solanaceae, Acanthaceae, Labiatae (Lamiaceae), Orchidaceae, Gramineae (Poaceae).	RP	Class lecture, power point presentation, interactive discussion	7 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (PRACTICAL-)

(BOT-G-CC-2-2-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
WORK OUT	Dissection, drawing and labelling, description of angiospermic plants and floral parts, floral formula and floral diagram, identification (family) from the following families: Leguminosae (Fabaceae), Malvaceae, Solanaceae, Labiatea (Lamiaceae), Acanthaceae.	BP	Demonstration, interactive discussion	5 hr
Identification	Macroscopic specimens of *Selaginella* and *Pteris*, male and female strobilus of *Cycas* and *Pinus*, Anatomical slides (stellar types, transfusion tissue, sieve tube, sunken stomata, lenticels), inflorescence types.	BP	Demonstration, interactive discussion	3 hr
Spot identification	Spot identification of the following Angiospermic plants (scientific names and families): *Sida rhombifolia* (Malvaceae), *Abutilon indicum* (Malvaceae), *Cassia sophera* (Fabaceae), *Tephrosia*	BP	Demonstration, interactive discussion	4 hr

	halimtonii (Fabaceae), *Crotolaria palida* (Fabaceae), *Coccinia grandis* (Cucurbitaceae), *Solanum indicum* (Solanaceae), *Nicotiana plumbagenifolia* (Solanaceae), *Leucas aspera* (Lamiaceae), *Leonurus sibiricus* (Lamiaceae), *Parthenium hysterophorus* (Asteraceae), *Tridax procumbense* (Asteraceae), *Eclipta prostrate* (Asteraceae), *Eragrostis tenella* (Poaceae), *Chrysopogon aciculantus* (Poaceae), *Eleusine indica* (Poaceae), *Vanda taesellata* (Orchidaceae).			
Field excursion	Local Excursions (at least two including one to Acharya Jagadish Chandra Bose Botanic Garden, Shibpur, Howrah)	BP	Demonstration, interactive discussion	3 hr
Herbarium	Demonstration for preparation of herbarium	BP	Demonstration, interactive discussion	3 hr

ACADEMIC SESSION 2019-20

SEMESTER-I GENERAL

PLANT DIVERSITY I
(BOT-G-CC-1-1-TH)

(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Introduction	Introduction to different plant groups	DS	Class lecture, power point presentation, interactive discussion	2 hr
Phycology	Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae, Classification: Criteria and system of Fritsch, Life histories of *Chlamydomonas*, *Chara* and *Ectocarpus*, Role of algae in the environment, agriculture, biotechnology and industry.	RP	Class lecture, power point presentation, interactive discussion	5 hr
Mycology	Diagnostic characters and examples of Oomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina (Ainsworth, 1973). Life histories of *Rhizopus* and *Ascobolus*, Economic	RP	Class lecture, power point presentation,	6 hr

	importance of fungi, Fungal symbioses: *Mycorrhiza*, Lichen and their importance.		interactive discussion	
Phytopathology	Symptoms - necrotic, hypoplastic and hyperplastic, Koch's postulates, Biotrophs and Necrotrophs, Disease triangle, Pathotoxins and phytoalexins (brief concept), Symptoms, causal organism, disease cycle and control measures of plant diseases (Late blight of potato, Brown spot of Rice, Stem rot of jute).	MM	Class lecture, power point presentation, interactive discussion	5 hr
Bryophytes	Unifying features of archaegoniates and transition to land habit, Amphibian nature of bryophytes, Diagnostic characters and examples of Hepaticopsida, Anthocerotopsida and Bryopsida (Proskauer 1957), Life histories of *Marchantia* and *Funaria*, Ecological and economic importance.	DS	Class lecture, power point presentation, interactive discussion	6 hr
Anatomy	Stomata - Types (Metcalfe & Chalk), Anatomy of root, stem and leaf of monocots and dicots, Stelar types and evolution, Secondary growth – normal in dicot stem and anomaly in stem of *Tecoma* & *Dracaena*	DS	Class lecture, power point presentation, interactive discussion	6 hr

SEMESTER-I GENERAL

PLANT DIVERSITY I (PRACTICAL)
(BOT-G-CC-1-1-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Work out	Microscopic preparation, drawing and labeling of *Chlamydomonas*, *Chara*, *Ectocarpus*, *Rhizopus* and *Ascobolus*-	BP	Demonstration, interactive discussion	5 hr
Anatomical studies	Stem- *Cucurbita*, sunflower and maize. Root- *Colocassia*, gram and orchid. Leaf- Nerium	BP	Demonstration, interactive discussion	6 hr
Identification	Cryptogamic specimens (macroscopic/microscopic as prescribed in the theoretical syllabus. Pathological specimens (herbarium sheets) of Late blight of potato, Brown spot of rice and stem rot of jute.	BP	Demonstration, interactive discussion	3 hr
Excursion/ field work	Study of plant diversity, habitat of algae and fungi	BP	Demonstration, interactive discussion	4 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (BOT-G-CC-2-2-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Pteridophytes	Diagnostic characters and examples of Psilophyta, Lycophyta, Sphenophyta & Filicophyta (Gifford & Foster 1989). Life histories of *Selaginella* and *Pteris*, Economic importance.	DS	Class lecture, power point presentation, interactive discussion	5 hr
Gymnosperms	Progymnosperms (brief idea), Diagnostic characters and examples of Cycadophyta, Coniferophyta and Gnetophyta (Gifford & Foster 1989), Life histories of Cycas and Pinus, Williamsonia (reconstructed), Economic importance of Gymnosperms.	DS	Class lecture, power point presentation, interactive discussion	5 hr
Paleobotany & Palynology	Fossil, fossilization process and factors of fossilization, Importance of fossil study. Geological time scale, Palynology - Definition, spore & pollen (brief idea), Applications.	MM	Class lecture, power point presentation,	5 hr

			interactive discussion	
Angiosperm Morphology	Inflorescence types with examples, Flower, Fruits and seeds- type and examples.	RP	Class lecture, power point presentation, interactive discussion	5 hr
Taxonomy of Angiosperms	Artificial, Natural and Phylogenetic systems of c1assificaiton with one example each, Diagnostic features of following families- Malvaceae, Leguminosae (Fabaceae), Cucurbitaceae, Rubiaceae, Compositae (Asteraceae), Solanaceae, Acanthaceae, Labiatae (Lamiaceae), Orchidaceae, Gramineae (Poaceae).	RP	Class lecture, power point presentation, interactive discussion	7 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (PRACTICAL-)

(BOT-G-CC-2-2-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
WORK OUT	Dissection, drawing and labelling, description of angiospermic plants and floral parts, floral formula and floral diagram, identification (family) from the following families: Leguminosae (Fabaceae), Malvaceae, Solanaceae, Labiatea (Lamiaceae), Acanthaceae.	BP	Demonstration, interactive discussion	5 hr
Identification	Macroscopic specimens of *Selaginella* and *Pteris*, male and female strobilus of *Cycas* and *Pinus*, Anatomical slides (stellar types, transfusion tissue, sieve tube, sunken stomata, lenticels), inflorescence types.	BP	Demonstration, interactive discussion	3 hr
Spot identification	Spot identification of the following Angiospermic plants (scientific names and families): *Sida rhombifolia* (Malvaceae), *Abutilon indicum* (Malvaceae), *Cassia sophera* (Fabaceae), *Tephrosia*	BP	Demonstration, interactive discussion	4 hr

	halimtonii (Fabaceae), *Crotolaria palida* (Fabaceae), *Coccinia grandis* (Cucurbitaceae), *Solanum indicum* (Solanaceae), *Nicotiana plumbagenifolia* (Solanaceae), *Leucas aspera* (Lamiaceae), *Leonurus sibiricus* (Lamiaceae), *Parthenium hysterophorus* (Asteraceae), *Tridax procumbense* (Asteraceae), *Eclipta prostrate* (Asteraceae), *Eragrostis tenella* (Poaceae), *Chrysopogon aciculantus* (Poaceae), *Eleusine indica* (Poaceae), *Vanda taesellata* (Orchidaceae).			
Field excursion	Local Excursions (at least two including one to Acharya Jagadish Chandra Bose Botanic Garden, Shibpur, Howrah)	BP	Demonstration, interactive discussion	3 hr
Herbarium	Demonstration for preparation of herbarium	BP	Demonstration, interactive discussion	3 hr

SEMESTER III GENERAL
CC-3/GE-3
(BOT-G-CC-3-3-TH)
(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
CELL BIOLOGY, GENETICS	Ultrastructure of nuclear envelope, nucleolus and their functions, Molecular organisation of metaphase chromosome (Nucleosome concept).	MM	Class lecture, power point presentation, interactive discussion	3 hr
	Chromosomal aberrations- deletion, duplication, inversion & translocation, Aneuploidy & Polyploidy-types, importance and role in evolution.	MM	Class lecture, power point presentation, interactive discussion	3 hr
	Central Dogma, Transcription and Translation.	MM	Class lecture, power point presentation,	4 hr

			interactive discussion	
	Genetic Code- properties.	MM	Class lecture, power point presentation, interactive discussion	2 hr
	Linkage group and Genetic map (three-point test cross).	MM	Class lecture, power point presentation, interactive discussion	3 hr
	Mutation – Point mutation (tautomerisation; transition, transversion and frame shift), Mutagen-physical and chemical.	MM	Class lecture, power point presentation, interactive discussion	3 hr
	Brief concept of Split gene, Transposons.	MM	Class lecture, power point presentation,	1 hr

			interactive discussion	
MICROBIOLOGY	Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance;	DS	Class lecture, power point presentation, interactive discussion	4 hr
	Bacteria- discovery, general characteristics and cell structure; reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.	DS	Class lecture, power point presentation, interactive discussion	5 hr

SEMESTER III GENERAL
CC-3/GE-3
(BOT-G-CC-3-3-TH)
(RACTICAL)

(BOT-G-CC-3-3-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Cell Biology:	Staining (Aceto-orcein) and squash preparation of onion root tip: study of mitotic stages. Determination of mitotic index (from onion root tip).	MM	Demonstration, experimental work	4 hr
Microbiology	Workout Gram staining (curd/any natural source)	DS	Demonstration, experimental work	3 hr
Identification	Cytological slides of different mitotic and meiotic stages. Different forms of bacteria (*Coccus*, *Bacillus*, *Spiral*)	MM, DS	Demonstration	3 hr

SEMESTER- III GENERAL

SEC-A

BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Biofertilizers	General account about microbes used as biofertilisers; *Rhizobium* identification, mass multiplication. Actinorrhizal symbiosis.	BP	Class lecture, power point presentation, interactive discussion	3 hr
Azospirillum	Identification, mass multiplication, associative effect of different microorganisms. *Azotobacter* and crop response to *Azotobacter* inoculums.	BP	Class lecture, power point presentation, interactive discussion	3 hr
Cyanobacteria	*Azolla*, *Anabaena* and *Azolla* association, blue green algae and *Azolla* in rice cultivation.	BP	Class lecture, power point presentation,	4 hr

			interactive discussion	
Mycorrhizal association	Types of Mycorrhizal association- Brief idea, Its influence on growth and yield of crop plants.	RP	Class lecture, power point presentation, interactive discussion	3 hr
Organic farming	Green manuring and organic fertilizers, Biocompost and vermicompost- making methods and field applications. Recycling of biodegradable municipal, industrial and agricultural wastes.	RP	Class lecture, power point presentation, interactive discussion	2 hr

SEMESTER IV
CC-4/ GE-4
(BOT-G-CC-4-4-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Proteins	Primary, secondary and tertiary structure, Nucleic acid- DNA structure, RNA types, Enzyme- Classifications with examples (IUBMB), Mechanism of action.	RP	Class lecture, power point presentation, interactive discussion	3 hr
Transport in plants	Ascent of sap and Xylem cavitation, Phloem transport and source-sink relation.	RP	Class lecture, power point presentation, interactive discussion	2 hr
Transpiration	Mechanism of stomatal movement, significance.	RP	Class lecture, power point presentation,	2 hr

			interactive discussion	
Photosynthesis	Pigments, Action spectra and Enhancement effect, Electron transport system and Photophosphorylation, C3 and C4 photosynthesis, CAM- Reaction and Significance.	RP	Class lecture, power point presentation, interactive discussion	4 hr
Respiration	Glycolysis & Krebs cycle— Reactions and Significance, ETS and oxidative phosphorylation.	DS	Class lecture, power point presentation, interactive discussion	3 hr
Nitrogen metabolism	Biological dinitrogen fixation, Amino acid synthesis (reductive amination and transamination).	DS	Class lecture, power point presentation, interactive discussion	2 hr
Plant Growth regulators	Physiological roles of Auxin, Gibberellin, Cytokinin, Ethylene, ABA	DS	Class lecture, power point presentation,	3 hr

			interactive discussion	
Photoperiodism	(Plant types, Role of phytochrome and GA in flowering) and Vernalization	DS	Class lecture, power point presentation, interactive discussion	3 hr
Senescence	Brief idea.	DS	Class lecture, power point presentation, interactive discussion	1 hr

SEMESTER IV
CC-4/ GE-4
(BOT-G-CC-4-4-P)
PRACTICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Plant Physiology	Experiment on Plasmolysis.	DS	Demonstration, experimental work	2 hr
	Measurement of leaf area (graphical method) and determination of transpiration rate per unit area by weighing method.	DS	Demonstration, experimental work	2 hr
	Imbibition of water by dry seeds - proteinaceous and fatty seeds.	DS	Demonstration, experimental work	2 hr
	Evolution of O_2 during photosynthesis (using graduated tube).	DS	Demonstration, experimental work	2 hr
	Evolution of CO_2 during aerobic respiration and measurement of volume.	DS	Demonstration, experimental work	2 hr

SEMESTER- IV GENERAL

SEC B

MUSHROOM CULTURE TECHNOLOGY (BOT-G-SEC-D-4/6-4)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Mushroom	Nutritional and medicinal value of mushrooms. Poisonous mushrooms.	RP	Class lecture, power point presentation, interactive discussion	2 hr
Cultivation techniques/ technology of edible mushrooms in India	*Volvarealla volvacea, Pleuretus citrinopyrineatus, Agaricus bisporus*.	RP	Class lecture, power point presentation, interactive discussion	4 hr
Storage	Short term and long term, storage, drying.	RP	Class lecture, power point presentation,	2 hr

			interactive discussion	
Food preparation	Types of foods prepared from mushroom. Cost and benefit ratio	RP	Class lecture, power point presentation, interactive discussion	2 hr
Research centres	National and regional.	RP	Class lecture, power point presentation, interactive discussion	2 hr

ACADEMIC SESSION 2020-21

SEMESTER-I GENERAL

PLANT DIVERSITY I
(BOT-G-CC-1-1-TH)

(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Introduction	Introduction to different plant groups	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
Phycology	Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae, Classification: Criteria and system of Fritsch, Life histories of *Chlamydomonas*, *Chara* and *Ectocarpus*, Role of algae in the environment, agriculture, biotechnology and industry.	RP	Online teaching through Google meet, ppt, interactive discussion	5 hr

Mycology	Diagnostic characters and examples of Oomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina (Ainsworth, 1973). Life histories of *Rhizopus* and *Ascobolus*, Economic importance of fungi, Fungal symbioses: *Mycorrhiza*, Lichen and their importance.	RP	Online teaching through Google meet, ppt, interactive discussion	6 hr
Phytopathology	Symptoms - necrotic, hypoplastic and hyperplastic, Koch's postulates, Biotrophs and Necrotrophs, Disease triangle, Pathotoxins and phytoalexins (brief concept), Symptoms, causal organism, disease cycle and control measures of plant diseases (Late blight of potato, Brown spot of Rice, Stem rot of jute).	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
Bryophytes	Unifying features of archaegoniates and transition to land habit, Amphibian nature of bryophytes, Diagnostic characters and examples of Hepaticopsida, Anthocerotopsida and Bryopsida (Proskauer 1957), Life histories of *Marchantia* and *Funaria*, Ecological and economic importance.	DS	Online teaching through Google meet, ppt, interactive discussion	6 hr
Anatomy	Stomata - Types (Metcalfe & Chalk), Anatomy of root, stem and leaf of monocots and dicots, Stelar types and evolution, Secondary growth – normal in dicot stem and anomaly in stem of *Tecoma* & *Dracaena*	DS	Online teaching through	6 hr

			Google meet, ppt, interactive discussion	

SEMESTER-I GENERAL

PLANT DIVERSITY I (PRACTICAL)
(BOT-G-CC-1-1-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Work out	Microscopic preparation, drawing and labeling of *Chlamydomonas, Chara, Ectocarpus, Rhizopus* and *Ascobolus*-	RP	Demonstration, interactive discussion	5 hr
Anatomical studies	Stem- *Cucurbita*, sunflower and maize. Root- *Colocassia*, gram and orchid. Leaf- Nerium	RP	Demonstration, interactive discussion	6 hr
Identification	Cryptogamic specimens (macroscopic/microscopic as prescribed in the theoretical syllabus. Pathological specimens (herbarium sheets) of Late blight of potato, Brown spot of rice and stem rot of jute.	RP	Demonstration, interactive discussion	3 hr

Excursion/ field work	Study of plant diversity, habitat of algae and fungi	RP	Demonstration, interactive discussion	4 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (BOT-G-CC-2-2-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Pteridophytes	Diagnostic characters and examples of Psilophyta, Lycophyta, Sphenophyta & Filicophyta (Gifford & Foster 1989). Life histories of *Selaginella* and *Pteris*, Economic importance.	DS	Online teaching through Google meet, ppt, interactive discussion	5 hr
Gymnosperms	Progymnosperms (brief idea), Diagnostic characters and examples of Cycadophyta, Coniferophyta and Gnetophyta (Gifford & Foster 1989), Life histories of Cycas and Pinus, Williamsonia (reconstructed), Economic importance of Gymnosperms.	DS	Online teaching through Google meet,	5 hr

			ppt, interactive discussion	
Paleobotany & Palynology	Fossil, fossilization process and factors of fossilization, Importance of fossil study. Geological time scale, Palynology - Definition, spore & pollen (brief idea), Applications.	MM	Online teaching through Google meet, ppt, interactive discussion	5 hr
Angiosperm Morphology	Inflorescence types with examples, Flower, Fruits and seeds- type and examples.	RP	Online teaching through Google meet, ppt, interactive discussion	5 hr
Taxonomy of Angiosperms	Artificial, Natural and Phylogenetic systems of c1assificaiton with one example each, Diagnostic features of following families- Malvaceae, Leguminosae (Fabaceae), Cucurbitaceae, Rubiaceae, Compositae (Asteraceae), Solanaceae, Acanthaceae, Labiatae (Lamiaceae), Orchidaceae, Gramineae (Poaceae).	RP	Online teaching through Google meet, ppt, interactive discussion	7 hr

SEMESTER II
CC-2/GE-2
PLANT DIVERSITY II (PRACTICAL-)

(BOT-G-CC-2-2-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
WORK OUT	Dissection, drawing and labelling, description of angiospermic plants and floral parts, floral formula and floral diagram, identification (family) from the following families: Leguminosae (Fabaceae), Malvaceae, Solanaceae, Labiatea (Lamiaceae), Acanthaceae.	RP	Demonstration, interactive discussion	5 hr
Identification	Macroscopic specimens of *Selaginella* and *Pteris*, male and female strobilus of *Cycas* and *Pinus*, Anatomical slides (stellar types, transfusion tissue, sieve tube, sunken stomata, lenticels), inflorescence types.	RP	Demonstration, interactive discussion	3 hr
Spot identification	Spot identification of the following Angiospermic plants (scientific names and families): *Sida rhombifolia* (Malvaceae), *Abutilon indicum* (Malvaceae), *Cassia sophera* (Fabaceae), *Tephrosia*	RP	Demonstration, interactive discussion	4 hr

	halimtonii (Fabaceae), *Crotolaria palida* (Fabaceae), *Coccinia grandis* (Cucurbitaceae), *Solanum indicum* (Solanaceae), *Nicotiana plumbagenifolia* (Solanaceae), *Leucas aspera* (Lamiaceae), *Leonurus sibiricus* (Lamiaceae), *Parthenium hysterophorus* (Asteraceae), *Tridax procumbense* (Asteraceae), *Eclipta prostrate* (Asteraceae), *Eragrostis tenella* (Poaceae), *Chrysopogon aciculantus* (Poaceae), *Eleusine indica* (Poaceae), *Vanda taesellata* (Orchidaceae).			
Field excursion	Local Excursions (at least two including one to Acharya Jagadish Chandra Bose Botanic Garden, Shibpur, Howrah)	RP	Demonstration, interactive discussion	3 hr
Herbarium	Demonstration for preparation of herbarium	RP	Demonstration, interactive discussion	3 hr

SEMESTER III GENERAL
CC-3/GE-3
(BOT-G-CC-3-3-TH)
(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
CELL BIOLOGY, GENETICS	Ultrastructure of nuclear envelope, nucleolus and their functions, Molecular organisation of metaphase chromosome (Nucleosome concept).	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Chromosomal aberrations- deletion, duplication, inversion & translocation, Aneuploidy & Polyploidy-types, importance and role in evolution.	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr

	Central Dogma, Transcription and Translation.	MM	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Genetic Code- properties.	MM	Online teaching through Google meet, ppt, interactive discussion	2 hr
	Linkage group and Genetic map (three-point test cross).	MM	Online teaching through Google meet, ppt, interactive discussion	3 hr
	Mutation – Point mutation (tautomerisation; transition, transversion and frame shift), Mutagen-physical and chemical.	MM	Online teaching through	3 hr

			Google meet, ppt, interactive discussion	
	Brief concept of Split gene, Transposons.	MM	Online teaching through Google meet, ppt, interactive discussion	1 hr
MICROBIOLOGY	Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance;	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
	Bacteria- discovery, general characteristics and cell structure; reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.	DS	Online teaching through Google meet, ppt, interactive discussion	5 hr

SEMESTER III GENERAL
CC-3/GE-3
(BOT-G-CC-3-3-TH)
(RACTICAL)

(BOT-G-CC-3-3-P)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Cell Biology:	Staining (Aceto-orcein) and squash preparation of onion root tip: study of mitotic stages. Determination of mitotic index (from onion root tip).	MM	Demonstration, experimental work	4 hr
Microbiology	Workout Gram staining (curd/any natural source)	DS	Demonstration, experimental work	3 hr
Identification	Cytological slides of different mitotic and meiotic stages. Different forms of bacteria (*Coccus*, *Bacillus*, *Spiral*)	MM, DS	Demonstration	3 hr

SEMESTER- III GENERAL

SEC-A

BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Biofertilizers	General account about microbes used as biofertilisers; *Rhizobium* identification, mass multiplication. Actinorrhizal symbiosis.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
Azospirillum	Identification, mass multiplication, associative effect of different microorganisms. *Azotobacter* and crop response to *Azotobacter* inoculums.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr

Cyanobacteria	*Azolla*, *Anabaena* and *Azolla* association, blue green algae and *Azolla* in rice cultivation.	RP	Online teaching through Google meet, ppt, interactive discussion	4 hr
Mycorrhizal association	Types of Mycorrhizal association- Brief idea, Its influence on growth and yield of crop plants.	RP	Online teaching through Google meet, ppt, interactive discussion	3 hr
Organic farming	Green manuring and organic fertilizers, Biocompost and vermicompost- making methods and field applications. Recycling of biodegradable municipal, industrial and agricultural wastes.	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr

SEMESTER IV
CC-4/ GE-4
(BOT-G-CC-4-4-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Proteins	Primary, secondary and tertiary structure, Nucleic acid- DNA structure, RNA types, Enzyme- Classifications with examples (IUBMB), Mechanism of action.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Transport in plants	Ascent of sap and Xylem cavitation, Phloem transport and source-sink relation.	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr
Transpiration	Mechanism of stomatal movement, significance.	DS	Online teaching through	2 hr

			Google meet, ppt, interactive discussion	
Photosynthesis	Pigments, Action spectra and Enhancement effect, Electron transport system and Photophosphorylation, C3 and C4 photosynthesis, CAM- Reaction and Significance.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
Respiration	Glycolysis & Krebs cycle— Reactions and Significance, ETS and oxidative phosphorylation.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Nitrogen metabolism	Biological dinitrogen fixation, Amino acid synthesis (reductive amination and transamination).	DS	Online teaching through Google meet, ppt, interactive discussion	2 hr

Plant Growth regulators	Physiological roles of Auxin, Gibberellin, Cytokinin, Ethylene, ABA	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Photoperiodism	(Plant types, Role of phytochrome and GA in flowering) and Vernalization	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Senescence	Brief idea.	DS	Online teaching through Google meet, ppt, interactive discussion	1 hr

SEMESTER IV
CC-4/ GE-4
(BOT-G-CC-4-4-P)
PRACTICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Plant Physiology	Experiment on Plasmolysis.	DS	Demonstration, experimental work	2 hr
	Measurement of leaf area (graphical method) and determination of transpiration rate per unit area by weighing method.	DS	Demonstration, experimental work	2 hr
	Imbibition of water by dry seeds - proteinaceous and fatty seeds.	DS	Demonstration, experimental work	2 hr
	Evolution of O_2 during photosynthesis (using graduated tube).	DS	Demonstration, experimental work	2 hr
	Evolution of CO_2 during aerobic respiration and measurement of volume.	DS	Demonstration, experimental work	2 hr

SEMESTER- IV GENERAL

SEC B

MUSHROOM CULTURE TECHNOLOGY (BOT-G-SEC-D-4/6-4)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Mushroom	Nutritional and medicinal value of mushrooms. Poisonous mushrooms.	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
Cultivation techniques/ technology of edible mushrooms in India	*Volvarealla volvacea, Pleuretus citrinopyrineatus, Agaricus bisporus*.	RP	Online teaching through Google meet, ppt, interactive discussion	4 hr

Storage	Short term and long term, storage, drying.	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
Food preparation	Types of foods prepared from mushroom. Cost and benefit ratio	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr
Research centres	National and regional.	RP	Online teaching through Google meet, ppt, interactive discussion	2 hr

SEMESTER- V

DSE A
PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-TH)
(THEORETICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Medicinal botany	History, scope and importance of medicinal plants, a broef idea about indigenous medicinal sciences- Ayurbeda, Siddha and Unani. Polyherbal formulations.	DS	Online teaching through Google meet, ppt, interactive discussion	5 hr
Phramacognosy	Scope and its importance, Primary metabolites, Secondary metabolites- alkaloids, terpenoids, phenolics and their functions.	DS	Online teaching through Google meet, ppt, interactive discussion	5 hr
Organoleptic	Evaluation of crude drugs.	DS	Online teaching	2 hr

			through Google meet, ppt, interactive discussion	
Pharmcologically active constituents	Source plants (one example), parts used and uses of: Steroids (Diosgenin, Digitoxin), Tannin (Catechin), Resins (Gingerol, Curcumnoids), Alkaloids (Strychnine, Reserpine, Vinblastine), Phenols (Capsaicin).	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Ethnobotany and folk medicine	Brief idea, Applications of ethnobotany, Application of natural product to certain diseases- Jaundice, Cardiac and Diabetics.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr

SEMESTER- V

DSE A

PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-P)

(PRACTICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Preparations of chemicals	Preparations of solution and buffers	DS	Demonstration	2 hr
Acquaintance with laboratory instruments-	Autoclave, Incubator, Clinical centrifuge, Analytical balance, pH meter, Colorimeter, Water bath, Distillation plant, Laminar air flow	DS	Demonstration	2 hr
Qualitative test	Proteins and carbohydrates, reducing and non reducing sugar (glucose, fructose and sucrose)	DS	Demonstration	4 hr
Chemical Tests	Tannin and alkaloid	DS	Demonstration	4 hr
Identification	Identification of medicinal plants	DS	Demonstration	3 hr
Field study	Listing of medicinal plants	DS	Demonstration	3 hr

SEMESTER- V GENERAL

SEC-A

BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Biofertilizers	General account about microbes used as biofertilisers; *Rhizobium* identification, mass multiplication. Actinorrhizal symbiosis.	RP	Class lecture, power point presentation, interactive discussion	3 hr
Azospirillum	Identification, mass multiplication, associative effect of different microorganisms. *Azotobacter* and crop response to *Azotobacter* inoculums.	RP	Class lecture, power point presentation, interactive discussion	3 hr
Cyanobacteria	*Azolla*, *Anabaena* and *Azolla* association, blue green algae and *Azolla* in rice cultivation.	RP	Class lecture, power point presentation,	4 hr

			interactive discussion	
Mycorrhizal association	Types of Mycorrhizal association- Brief idea, Its influence on growth and yield of crop plants.	RP	Class lecture, power point presentation, interactive discussion	3 hr
Organic farming	Green manuring and organic fertilizers, Biocompost and vermicompost- making methods and field applications. Recycling of biodegradable municipal, industrial and agricultural wastes.	RP	Class lecture, power point presentation, interactive discussion	2 hr

SEMESTER- VI

DSE B

HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-B-6-4-TH)
THEORETICAL

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Horticulture-	role in rural economy and employment generation. Urban horticulture- its scope and importance.	DS	Online teaching through Google meet, ppt, interactive discussion	3 hr
Ornamental plants	Identification and salient features of some ornamental plants (rose, marigold, gladiolus, gerberas, tube rose, carnations, cacti and succulents). Ornamental flowering trees (Gulmohor, Lagerstromia, Shimul, Coral tree and jacaranda).	DS	Online teaching through Google meet, ppt, interactive discussion	5 hr

Identification of some fruits and vegetable plants	Citrus, Banana, Papaya, Mango, Jackfruit, Chillies and cucurbits. Fruit processing- scope and benefits.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
Horticultural techniques	Propagation methods, application of manure, fertilizers, nutrients and PGR. Weed control. Biofertilizers and biopesticides.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
Post harvest technology	Importance of post harvest technology in horticultural practices. Harvesting and handling of fruits, vegetables and cut flower. Methods of preservation and processing.	DS	Online teaching through Google meet, ppt, interactive discussion	4 hr
Disease control and management	field and post harvest diseases of common crops. Crop sanitation, quarantine practices. Identification of common diseases and pest of fruits and vegetable crops.	DS	Online teaching through	3 hr

			Google classroom, Google meet, ppt, interactive discussion	

SEMESTER VI GENERAL

HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-B-6-4-P)

(PRACTICAL)

(JANUARY TO JUNE)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Field trips:	gardens, standing crop sites, nurseries, vegetable gardens, horticultural fields and cold storages.	RP	Demonstration	3 hr

SEMESTER- VI GENERAL

SEC B

MUSHROOM CULTURE TECHNOLOGY (BOT-G-SEC-D-4/6-4)

(THEORITICAL)

TOPIC	SUBTOPIC	TEACHER	TEACHING METHOD	CLASS HOUR
Mushroom	Nutritional and medicinal value of mushrooms. Poisonous mushrooms.	RP	Class lecture, power point presentation, interactive discussion	2 hr
Cultivation techniques/ technology of edible mushrooms in India	*Volvarealla volvacea, Pleuretus citrinopyrineatus, Agaricus bisporus*.	RP	Class lecture, power point presentation, interactive discussion	4 hr
Storage	Short term and long term, storage, drying.	RP	Class lecture, power point presentation,	2 hr

			interactive discussion	
Food preparation	Types of foods prepared from mushroom. Cost and benefit ratio	RP	Class lecture, power point presentation, interactive discussion	2 hr
Research centres	National and regional.	RP	Class lecture, power point presentation, interactive discussion	2 hr

Teaching Plan

COMMERCE

2020-21

B.Com (Hons & General) Semester I

Economic I and Statistics	Name of subjects with Topic	Teacher	
		Honours	General
	Economics I		
	Unit: I Demand and Consumer Behaviour	MP	MP
	Unit :II Production and cost	MP	MP
	Unit: III Perfect Competition	MP	MP
	Statistics		
	Fundamentals	SP	SP
	Measures of central Tendency	SP	SP
	Measures of Dispersion	SP	SP
	Moments, Skewness and Kurtosis	SP	SP
	Interpolation	SP	SP

Principles of Management	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I Introduction	KC	KC
	Unit: II Planning	AM	AM
	Unit :III Organising	AM	AM
	Unit: IV Directing and Staffing	KC	KC
	Unit :V Motivation, Co-ordination and Control	KC	KC

Business Laws	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I The Indian Contract Act, 1872	KC	KC
	Unit: II The Sale of Goods Act, 1930	SMD	SMD
	Unit :III The Limited Liability Partnership Act, 2008	KC	KC
	Unit: IV The Negotiable Instrument Act, 1981	SMD	SMD
	Unit :V Consumer Protection Act, 1986	SMD	SMD

Financial Accounting I	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I Introduction	AR,SD	AM
	Unit: II Concepts for Determination of Business Income	SD,PKS	SMD
	Unit :III Introduction to Accounting Standard, Introduction to Accounting Theory	AR, SD	AM
	Unit: IV Final Accounts of Trading Concern	AR	SCD
	Unit :V Financial statements from Incomplete Records and of NPO	SD	SMD
	Unit VI Accounting for special sales transaction, Sectional and Self Balancing Ledger	AR,PKS	AM
	Unit VI Insurance Claim for Loss of Stock & for Loss of Profit	SD	AM

B.Com (Hons& General) Semester II

E Commerce and Business Communication	Name of subjects with Topic	Teacher	
	E- Commerce	Honours	General
	Unit I Introduction	PKS	PKS
	Unit: II E-CRM and SCM	PKS	PKS
	Unit :III Digital Payment	PKS	PKS
	Unit: IV ERP	PKS	PKS
	Unit :V New Trends in E-Commerce	PKS	PKS
	Business Communication		
	Name of Topic	Teacher	
		Honours	General
	Unit :I Introduction	SMD	SMD
	Unit :II Types of Communication	SMD	SMD
	Unit :III Tools of Communication	SMD	SMD
	Unit : IV Drafting	SMD	SMD

Company Law	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I Introduction to Company	SCD,SMD	SCD,SMD
	Unit: II Formation of a Company	SCD	SCD
	Unit :III Company Administration	SMD	SMD
	Unit: IV Share Capital and Debenture	SMD	SMD
	Unit :V Corporate Meetings	SMD	SMD

Marketing Management and Human Resource Management	Name of subjects with Topic	Teacher	
	Module I Marketing Management	Honours	General
	Unit I Introduction	AM	AM
	Unit: II Consumer Behaviour and Marketing Segmentation	AM	AM
	Unit :III Product	AM	AM
	Unit: IV Pricing, Distribution Channels and Physical Distribution	AM	AM
	Unit :V Promotion and Recent Developments in Marketing	AM	AM
	Module II Human Resource management		
	Unit I Nature and Scope	KC	KC
	Unit II Human Resource Planning	KC	KC
	Recruitment and Selection	KC	KC
	Unit IV Training and Development	KC	KC
	Unit V Jab Evaluation and Performance Appraisal	KC	KC

Cost & Management Accounting I	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I Introduction	AR, SD	AM
	Unit: II Material costs	SCD	SMD
	Unit :III Employee Cost and Incentive Systems	AR	AM
	Unit: IV Overhead and Cost Statement	SD	SMD
	Unit :V Cost Book- Keeping Reconciliation of Cost and Financial records	SD	PKS
	Unit VI Cost Methods Service Costing, Process Costing, Contract Costing, Job Costing	AR, SD, SCD	PKS

Semester III

Information Technology and its Application in Business	Name of subjects with Topic Module I	Teacher	
		Honours	General
	Unit I Information Technology and Business	BM	BM
	Unit: I Data Organization and Data Base Management System Data organisation Database Management System	BM	BM
	Unit :III Internet and its Applications	SH	SH
	Unit: IV Security and Encryption	SH	SH
	Unit :V IT Act,2000 and Cyber Crimes	SH	SH
	Module II		
	Unit I Word Processing	BM	BM
	Unit II Preparing Presentations	BM	BM
	Unit III Spreadsheet and its Business Applications Spreadsheet Functions Creating Spreadsheet in the area of	BM	BM
	Unit IV Database Management System	SH	SH
	Unit V Website Designing	SH	SH

Business mathematics and Statistics	Name of subjects with Topic Module I	Teacher	
		Honours	General
	Unit I Permutations and Combinations	SP	SP
	Unit: I Set Theory	SP	SP
	Unit :III Binomial Theorem	SP	SP
	Unit: IV Logarithm	SP	SP
	Unit :V Compound Interest and Annuities	SP	SP
	Module II	SP	SP
	Unit I Correlation and Association	SP	SP
	Unit II Regression Analysis	SP	SP
	Unit III Index Numbers	SP	SP
	Unit IV Time Series Analysis	SP	SP
	Unit V Probability Theory	SP	SP

Financial Accounting II	Name of subjects with Topic	Teacher	
		Honours	General
	Unit I Partnership Accounts I	AR, SD,AM	AR,PKS
	Unit: II Partnership Accounts II	SD	PKS
	Unit :III Branch Accounting	AM	SMD
	Unit: IV Hire Purchase and Instalment Payment System	SD	SMD
	Unit :V Departmental Accounts	AR	AR
	Unit VI Investment Accounts	AR	AR
	Unit VII Business Acquisition and Conversion of Partnership into limited company	AR, SD	PKS

Indian Financial System	Name of subjects with Topic	Honours
	Unit I Financial System and its Components	SD
	Unit: II Financial Markets Money Market (AM) Capital Market (SD)	AM, SD
	Unit :III Financial Institutions	SCD
	Unit: IV Financial services	AM
	Unit :V Investors' protection	SCD

Semester IV

Micro Economics II and Indian Economy	Name of subjects with Topic	Teacher	
	Module I	Honours	General
	Unit I Monopoly	MP	MP
	Unit: II Imperfect Competition	MP	MP
	Unit :III Factor Price Determination	MP	MP
	Module II	MP	MP
	Unit I Basic Issues and Economic Development	MP	MP
	Unit II Basic Features of Indian Economy	MP	MP
	Unit III Sectoral Trends and Issues	MP	MP
	Unit IV Social Issues and Indian Economy	MP	MP

Entrepreneurship Development and Business Ethics	Name of subjects with Topic Module I	Teacher	
		Honours	General
	Unit I Introduction	KC	KC
	Unit: II Public and Private System of stimulation, Support and sustainability of entrpreneurshipetc	KC	KC
	Unit :III Sources of Business , Ideas and Test of feasibility etc.	KC	KC
	Unit IV Mobilizing of Resources	KC	KC
	Module II		
	Unit I Business Ethics	AM	AM
	Unit II Principles of Business Ethics	AM	AM
	Unit III Ethics in Management	AM	AM
	Unit IV Corporate Culture	AM	AM
	Unit V Ethics and Corporate Governance	AM	AM

Taxation I	Name of subjects with Topic	Honours	General
	Unit I Basic Concepts and Definitions under IT Act Residential Status and Incidence of Tax Incomes which do not form part of Total income Agricultural Income	AR, SD	AM
	Unit: II Heads of Income and Provisions Governing Heads of Income Salaries Income from House Property	SD,AR	PKS
	Unit :III Heads of Income and Provisions Governing Heads of Income Profits and Gains from Business and Profession Capital Gain Income from others	AM, SD	AM
	Unit: IV Income of other Persons included in Assessee's Total Income Set Off and Carry Forward of Losses	SD,AM	PKS

	Deductions from GTST **Rebate u/s 87A**		

Cost and Management Accounting II	**Name of subjects with Topic**	**Honours**	**General**
	Unit I Joint Product and By Product **Activity Based Costing**	**SD**	**SCD**
	Unit: II Budget and Budgetary Control	**AR**	**SMD**
	Unit :III Standard Costing	**AR**	**SMD**
	Unit: IV CVP Analysis and Marginal Costing	**SCD**	**SCD**
	Unit :V Short Term Decision Making	**SD**	**SMD**

SEM V

Auditing and Assurance	**Name of subjects with Topic**	**Honours**	**General**
	Unit I Concept , Need and Purpose of Audit	**KC**	**KC**
	Unit: II Audit Procedure and Techniques	**KC**	**KC**
	Unit :III Audit Risk and Internal Control System	**KC**	**KC**
	Unit: IV Vouching, Verification and Valuation	**KC**	**KC**
	Unit :V Company Audit	**SCD**	**SMD**
	Unit :VI Audit Report an Certificate	**SCD**	**SMD**
	Unit :VII Other Thrust Areas	**SCD**	**SMD**

Taxation II	**Name of subjects with Topic**	**Honours**	**General**
	Unit I Computation of Total Income and Tax Payable	**SD,AM**	**PKS**
	Unit: II Tax Management	**AR**	**SMD**
	Unit :III Basic Concepts of Indirect Tax and otherwise of GST	**SD**	**PKS**
	Unit: IV Taxable event, Supply-Concept, Time, Value and Place,	**SD**	**SMD**

	Charges of GST		
	Unit :V Input and Output Tax Consumption , Input tax Credit and Composition Scheme under GST	**AR**	**PKS**
	Unit :VI Customs	**AM**	**SMD**

Macro Economics and Advanced	**Name of subjects with Topic Module I**	**Honours**
	Unit I Introduction	**MP**
Business Mathematics	**Unit: II National Income Accounting**	**MP**
	Unit :III Determination of Equilibrium Level of National Income	**MP**
	Unit: IV Commodity Market and Money Market Equilibrium	**MP**
	Unit :V Money, Inflation and Unemployment	**MP**
	Module II	
	Unit I Functions, Limit and Continuity	**SP**
	Unit II Differentiation and Integration	**SP**
	Unit III Applications of Derivative and Integration	**SP**
	Unit IV Determinants	**SP**
	Unit V Matrix	**SP**

Corporate Accounting	Name of subjects with Topic	Honours	General
	Unit I Company Introduction and Accounting for Shares and Debentures	SD	SMD
	Unit: II Buy back and Redemption of Preference Shares	SD	PKS
	Unit :III Company Final Accounts	AR	SCD
	Unit: IV Redemption of Debenture	AM	SMD
	Unit :V Valuation of Goodwill & Shares	AM	PKS
	Unit :VI Company Merger and Reconstruction	AR	SCD

SEM VI

Project Work (Project Work Report 50 + Viva Voce Examination 50)

Financial Reporting and Financial Statement Analysis	Name of subjects with Topic	Honours	General
	Unit I Holding Company	AR	AR
	Unit: II Accounting Standards	AR	SMD
	Unit :III Fund Flow Statement	AR	KC
	Unit: IV Cash Flow Statement	AM	KC
	Unit :V Introduction to Financial Statement Analysis	AM	AR
	Unit :VI Accounting Ratios for FSA	AM	SMD

Financial Management	Name of subjects with Topic	Honours	General
	Unit I Introduction Basic Concepts	SD	KC,SMD
	Unit: II Sources of Finance (KC) Cost of Capital (SD)	KC,SD	KC
	Unit :III leverage and Capital Structure Theories	SMD	SMD
	Unit: IV working Capital Management (1)	SMD	SMD
	Unit: V working Capital	SMD	SMD

	Management (2)		
	Unit :VI Capital Expenditure Decisions (1)	**SD**	**KC**
	Unit :VII Capital Expenditure Decisions (2)	**SD**	**SMD**
	Unit :VII Dividend Decisions	**KC**	**KC**

Computerised Accounting and E-Filling of Tax Return	**Name of subjects with Topic**	**Honours**	**General**
	Unit I Computerised Accounting package: Using Generic Software	**SH**	**SH**
	Unit: II Designing Computerised Accounting System	**SH**	**SH**
	Unit :III E-filling of tax Return	**PKS**	**PKS**

Project Work: Assignment based for each and every topic should be prepared

DEPARTMENT OF ENGLISH

TEACHING PLAN FOR ACADEMIC SESSION 2018-2019 : ODD SEMESTER

NAME OF FACULTY: PROF SWATI MUSTAPHI

SUBJECT – ENGA SEMESTER I, CC I and CC II

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC I	1	GROUP A	OLD ENGLISH PERIOD
ENGA CC I	2	GROUP A	CHAUCER
ENGA CC I	3	GROUPA	ELIZABETHAN PERIOD
ENGA CC I	4	GROUPA	JACOBEAN PERIOD
ENGA CC I	5	GROUPA	RESTORATION
ENGA CC I	6	GROUPA	AUGUSTAN PERIOD
ENGA CC I -PHILOLOGY	7	GROUP B	LATIN, SCANDINAVIAN, FRENCH INFLUENCE
ENGA CC I-PHILOLOGY	8	GROUP B	CONSONANT SHIFT, AMERICANISM
ENGA CC I-PHILOLOGY	9	GROUP B	WORD-FORMATION PROCESSES
ENGA CC II	10	GROUP C	HORACE: SATIRE 1.4
ENGA CC II	11	GROUP C	HORACE: SATIRE 1.4
ENGA CC II	12	GROUP C	OVID
ENGA CC II	13	GROUP C	OVID
ENGA CC II	14	GROUP C	OVID
ENGA CC I	15	ALL	CLASS DISCUSSIONS
ENGA CC II	16	ALL	CLASS DISCUSSIONS

NO. OF CLASSES ALLOTTED: 05 . EACH CLASS IS OF 60 MINUTES DURATION.

PHASE I: FROM THE START OF THE SESSION IN JULY TO THE START OF AUTUMN RECESS IN THE SECOND WEEK OF OCTOBER 2018.

PHASE II: FROM THE END OF AUTUMN RECESS TO THE THIRD WEEK OF NOVEMBER 2018.

Mode of Teaching: class discussions and e-resources

DEPARTMENT OF ENGLISH

TEACHING PLAN FOR ACADEMIC SESSION 2018-2019 : EVEN SEMESTER

NAME OF FACULTY: PROF SWATI MUSTAPHI

SUBJECT – ENGA SEMESTER II CC IV

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC IV	1	DRAMA	*MACBETH*
ENGA CC IV	2	DRAMA	*MACBETH*
ENGA CC IV	3	DRAMA	*MACBETH*
ENGA CC IV	4	DRAMA	*MACBETH*
ENGA CC IV	5	DRAMA	*MACBETH*
ENGA CCIV	6	DRAMA	*MACBETH*
ENGA CC IV	7	DRAMA	*MACBETH*
ENGA CC IV	8	DRAMA	*MACBETH*
ENGA CC IV	9	DRAMA	*MACBETH*
ENGA CC IV	10	DRAMA	*MACBETH*
ENGA CC IV	11	DRAMA	*MACBETH*
ENGA CC IV	12	DRAMA	*MACBETH*
ENGA CC IV	13	DRAMA	*MACBETH*
ENGA CC IV	14	DRAMA	*MACBETH*
ENGA CC IV	15	DRAMA	*MACBETH*
ENGA CC IV	16	DRAMA	*MACBETH*

NO. OF CLASSES ALLOTTED: 08. EACH CLASS IS OF 60 MINUTES DURATION.

Mode of Teaching: class discussions and e-resources

DEPARTMENT OF ENGLISH

TEACHING PLAN FOR ACADEMIC SESSION 2019-2020 : ODD SEMESTER

NAME OF FACULTY: PROF SWATI MUSTAPHI

SUBJECT – ENGA SEMESTER I, CC I and CC II

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC I	1	GROUP A	LATIN INFLUENCE, AMERICANISM
ENGA CC I	2	GROUP A	SCANDINAVIAN INFLUENCE
ENGA CC I	3	GROUPA	FRENCH INFLUENCE
ENGA CC I	4	GROUPA	WORD FORMATION PROCESSES: 1
ENGA CC I	5	GROUPA	WORD FORMATION PROCESSES:2
ENGA CC I	6	GROUPA	CONSONANT SHIFT
ENGA CC I -PHILOLOGY	7	GROUP B	SHORT NOTES
ENGA CC I-PHILOLOGY	8	GROUP B	SHORT NOTES
ENGA CC II	9	GROUP C	HORACE: SATIRE 1.4
ENGA CC II	10	GROUP C	HORACE: SATIRE 1.4
ENGA CC II	11	GROUP C	HORACE: SATIRE 1.4
ENGA CC II	12	GROUP C	OVID: METAMORPHOSIS BOOK III
ENGA CC II	13	GROUP C	OVID : METAMORPHOSIS BOOK III
ENGA CC II	14	GROUP C	OVID :METAMORPHOSIS BOOK III
ENGA CC II	15	GROUP C	OVID: METAMORPHOSIS BOOK III
ENGA CC II	16	ALL	CLASS DISCUSSIONS

SUBJECT – ENGA SEMESTER III, CC VII, SEC-A2

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC VII	1	POETRY	*PARADISE LOST* – BOOK 1
ENGA CC VII	2	POETRY	*PARADISE LOST* – BOOK 1
ENGA CC VII	3	POETRY	*PARADISE LOST* – BOOK 1
ENGA CC VII	4	POETRY	*PARADISE LOST* – BOOK 1
ENGA CC VII	5	POETRY	*PARADISE LOST* – BOOK 1
ENGA CC VII	6	POETRY	*PARADISE LOST* – BOOK 1
ENGA SEC A2	7	BUSINESS COMMUNICATION	ALL
ENGA SEC-A2	8	BUSINESS COMMUNICATION	ALL
ENGA SEC-A2	9	BUSINESS COMMUNICATION	ALL
ENGA SEC-A2	10	BUSINESS COMMUNICATION	ALL
ENGA CC VII	11	DRAMA	*THE ROVER*
ENGA CC VII	12	DRAMA	*THE ROVER*
ENGA CC VII	13	DRAMA	*THE ROVER*
ENGA CC VII	14	DRAMA	*THE ROVER*
ENGA CC VII	15	DRAMA	*THE ROVER*
ENGA CC VII	16	DRAMA	*THE ROVER*

No.of classes allotted for ENGA SEMESTER I : 05
No. of classes allotted for ENGA SEMESTER III : 03

Mode of Teaching: class discussions and e-resources

DEPARTMENT OF ENGLISH

TEACHING PLAN FOR ACADEMIC SESSION 2019-2020 : EVEN SEMESTER

NAME OF FACULTY: PROF SWATI MUSTAPHI

SUBJECT – ENGA SEMESTER II CC IV MODE OF TEACHING : ONLINE CLASSES FROM MARCH 2020

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC IV	1	DRAMA	*MACBETH*
ENGA CC IV	2	DRAMA	*MACBETH*
ENGA CC IV	3	DRAMA	*MACBETH*
ENGA CC IV	4	DRAMA	*MACBETH*
ENGA CC IV	5	DRAMA	*MACBETH*
ENGA CCIV	6	DRAMA	*MACBETH*
ENGA CC IV	7	DRAMA	*MACBETH*
ENGA CC IV	8	DRAMA	*MACBETH*
ENGA CC IV	9	DRAMA	*MACBETH*
ENGA CC IV	10	DRAMA	*MACBETH*
ENGA CC IV	11	DRAMA	*MACBETH*
ENGA CC IV	12	DRAMA	*MACBETH*
ENGA CC IV	13	DRAMA	*MACBETH*
ENGA CC IV	14	DRAMA	*MACBETH*
ENGA CC IV	15	DRAMA	*MACBETH*
ENGA CC IV	16	DRAMA	*MACBETH*

SUBJECT – ENGA SEMESTER IV CC VIII, CCIX

SUBJECT and Course	WEEK	SECTION/GROUP	TOPIC
ENGA CC VIII	1	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	2	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	3	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	4	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	5	NOVEL	*ROBINSON CRUSOE*
ENGA CCVIII	6	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	7	NOVEL	*ROBINSON CRUSOE*
ENGA CC VIII	8	NOVEL	*ROBINSON CRUSOE*
ENGA CC IX	9	NOVEL	*FRANKENSTEIN*
ENGA CC IX	10	NOVEL	*FRANKENSTEIN*
ENGA CC IX	11	NOVEL	*FRANKENSTEIN*
ENGA CC IX	12	NOVEL	*FRANKENSTEIN*
ENGA CC IX	13	NOVEL	*FRANKENSTEIN*
ENGA CC IX	14	NOVEL	*FRANKENSTEIN*
ENGA CC IX	15	NOVEL	*FRANKENSTEIN*
ENGA CC IX	16	NOVEL	*FRANKENSTEIN*

No. of classes allotted for ENGA SEMESTER II : 03
No. of classes allotted for ENGA SEMESTER IV : 04

Mode of Teaching: class discussions and e-resources

DEPARTMENT OF ENGLISH

TEACHING PLAN FOR ACADEMIC SESSION 2020-2021 : ODD SEMESTER

NAME OF FACULTY: PROF SWATI MUSTAPHI

SUBJECT – ENGA SEMESTER I, CC I and CC II MODE OF TEACHING: ONLINE CLASSES ONLY

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC I- PHILOLOGY	1	GROUP B	SCANDINAVIAN INFLUENCE
ENGA CC I -PHILOLOGY	2	GROUP B	FRENCH INFLUENCE
ENGA CC I -PHILOLOGY	3	GROUP B	LATIN INFLUENCE, AMERICANISM
ENGA CC I -PHILOLOGY	4	GROUP B	CONSONANT SHIFT
ENGA CC I -PHILOLOGY	5	GROUP B	WORD-FORMATION PROCESSES-1
ENGA CC I -PHILOLOGY	6	GROUP B	WORD-FORMATION PROCESSES-2
ENGA CC I -PHILOLOGY	7	GROUP B	SHORT NOTES
ENGA CC I-PHILOLOGY	8	GROUP B	SHORT NOTES
ENGA CC II	9	GROUP C	*METAMORPHOSIS: BOOK III*
ENGA CC II	10	GROUP C	*METAMORPHOSIS: BOOK III*
ENGA CC II	11	GROUP C	*METAMORPHOSIS: BOOK III*
ENGA CC II	12	GROUP C	*METAMORPHOSIS: BOOK III*
ENGA CC II	13	GROUP C	*METAMORPHOSIS: BOOK III*
ENGA CC II	14	GROUP C	HORACE: *SATIRE I.IV*
ENGA CC I	15	GROUP C	HORACE: *SATIRE I.IV*
ENGA CC II	16	GROUP C	HORACE: *SATIRE I.IV*

SUBJECT – ENGA SEMESTER III, CC VII

SUBJECT and PAPER	WEEK	SECTION/GROUP	TOPIC
ENGA CC VII	1	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	2	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	3	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	4	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	5	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	6	POETRY	*THE RAPE OF THE LOCK*
ENGA CCVII	7	POETRY	*THE RAPE OF THE LOCK*
ENGA CCVII	8	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	9	POETRY	*THE RAPE OF THE LOCK*
ENGA CCVII	10	POETRY	*THE RAPE OF THE LOCK*
ENGA CC VII	11	POETRY	*PARADISE LOST- BOOK 1*
ENGA CC VII	12	POETRY	*PARADISE LOST- BOOK 1*
ENGA CC VII	13	POETRY	*PARADISE LOST- BOOK 1*
ENGA CC VII	14	POETRY	*PARADISE LOST- BOOK 1*
ENGA CC VII	15	POETRY	*PARADISE LOST- BOOK 1*
ENGA CC VII	16	POETRY	*PARADISE LOST- BOOK 1*

SUBJECT – ENGA SEMESTER V, DSE A-2, DSE-B-1

SUBJECT and COURSE	WEEK	SECTION/GROUP	TOPIC
ENGA DSE-A2	1	LITERARY CRITICISM	WORDSWORTH
ENGA DSE-A2	2	LITERARY CRITICISM	WORDSWORTH
ENGA DSE-A2	3	LITERARY CRITICISM	COLERIDGE
ENGA DSE-A2	4	LITERARY CRITICISM	COLERIDGE
ENGA DSE-A2	5	LITERARY CRITICISM	ELIOT
ENGA DSE-A2	6	LITERARY CRITICISM	ELIOT
ENGA DSE-A2	7	LITERARY CRITICISM	CLASS DISCUSSIONS
ENGA DSE-A2	8	LITERARY CRITICISM	CLASS DISCUSSIONS
ENGA DSE-A2	9	PROSODY	SCANSION
ENGA DSE-B1	10	PROSODY	SCANSION
ENGA DSE-B1	11	PROSODY	SCANSION
ENGA DSE-B1	12	PROSODY	SCANSION
ENGA DSE-B1	13	PROSODY	SCANSION
ENGA DSE-B1	14	PROSODY	SCANSION
ENGA DSE-B1	15	PROSODY	SCANSION
ENGA DSE-B1	16	PROSODY	SCANSION

No. of classes allotted for ENGA SEMESTER I:02
No. of classes allotted for ENGA SEMESTER III: 03
No. of classes allotted for ENGA SEMESTER V: 05

Mode of Teaching: class discussions and e-resources

Dr. Kanailal Bhattacharyya College

Department of History

Topic wise teaching plan (2020-2021)

Subject : HISTORY (HONOURS)

CC1 : History of India From Earliest times to C 300 BCE

- **Reconstucting ancient Indian History – Bidusi sardar**
- **Hunter Gatherers and the advent of food products – Ruma Banerjee**
- **The Harappan Civilisation – Ruma Bannerjee**
- **Cultures in transition – Bidusi Sardar**

CC2 : Social Formation and Cultural Patterns of the ancient World other than India – Subhasish Ghosh

CC3 : History of India C300 BCE to C750 CE

- **Economy and Society – Bidusi Sardar**
- **Changing Political Formation – Bidusi Sardar**
- **Towards Early Medieval India – Ruma Banerjee**
- **Religion Philosophy and Society – Bidusi Sardar**
- **Cultural Developments – Ruma Bannerjee**

CC4 : Social Formation and Cultural Patterns of the Medieval World other than India – Subhasish Ghosh

CC5 : History of India (CE700 -1206) – Ruma Banerjee

CC6 : Rise of the Modern West – I – Subhasish Ghosh

CC7 : History of India (C1206 - 1526) – Bidusi Sardar

CC8 : Rise of the Modern West – II – Subhasish Ghosh

CC9 : History of India (C1526 - C1605) – Ruma Banerjee

CC10 : History of India (C1605 - C1750) – Bidusi Sardar

CC11 : Hstory of the Modern Europe (C1780- 1939) –Subhasish Ghosh

CC12 : History of India (C1750 to 1857)- Ruma Banerjee

CC13 : History of India (C1857 to 1964)- Bidusi Sardar

CC14 :History of World Politics (C1945 to 1994) – Subhasish Ghosh

SEC A : Archives and Museum – Subhasish Ghosh

SEC B : Understanding Popular Culture – Bidusi Sardar

DSE A1 : History of Bengal(C 1757 - 1905) - Bidusi Sardar

DSE B1 : History of Bengal(C1905- 1947) – Ruma Banerjee

DSE A1 : History of Modern East Asia I China(C1840-1949) – Bidusi Sardar

DSE B1 : History of Modern East Asia II Japan (C1868-1945) – Bidusi Sardar

Under CBCS System

Semester 4 (January – June 2021)

*BNGA CC – 8 (*প্রাগাধুনিক সাহিত্য)

CC- 8	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ বৈষ্ণব পদাবলী (কঃ বিঃ সংস্করণ) প্রারম্ভিক আলোচনা নীরদ নয়নে নীর ঘন সিঞ্চনে আজু হাম কি পেখলু নবদ্বীপ চন্দ দঁড়াইয়া নন্দের আগে গোপাল কান্দে অনুরাগে ঘরের বাহিরে দন্ডে শতবার রূপ লাগি আখি ঝুরে গুনে মন ভোর এমন পীরিতি কভু নাহি দেখি শুনি সখি কি পুছসি অনুভব মোয় কণ্টক গাড়ি কমলসম পদতল মন্দির বাহির কঠিন কপাট কি মোহিনী জান বঁধু কি মোহিনী জান বঁধু তুমি যে আমার প্রান অঙ্কুর তপন তাপে যদি জারব বহুদিন পরে বঁধুয়া এলে তাতল সৈকত বারিবিন্দুসম	AD KK	8 8	বৈষ্ণব পদাবলী বৈষ্ণব পদাবলী	Lecture, Discussion, Question and Answer
মডিউল – ২ চন্ডীমঙ্গল (১ম খন্ড) মুকুন্দ চক্রবর্তী (কঃ বিঃ সংস্করণ)	MB	15	চন্ডীমঙ্গল	Lecture, Discussion, Question and Answer
মডিউল – ৩ শাক্ত পদাবলী (কঃ বিঃ সংস্করণ) প্রারম্ভিক আলোচনা গিরিবর, আর আমি পারিনে হে, প্রবোধ দিতে উমারে (বাল্যলীলা) গিরি এবার আমার উমা এলে (আগমনী) কবে যাবে বল গিরিরাজ (আগমনী) বারে বারে কহ রানি গৌরী আনিবারে (আগমনী) ওরে হর গঙ্গাধর, কর অঙ্গীকার (আগমনী) গিরি রানি, এই নাও তোমার উমারে (আগমনী) ওরে নবমী নিশি, না হইও রে (বিজয়া) ওহে প্রাননাথ গিরিবর হে (বিজয়া) কেবল আসার আশা ভবে আসা (ভক্তের আকুতি) মা গো তারা ও শঙ্করি (ভক্তের আকুতি) মা আমায় ঘুরাবে কত (ভক্তের আকুতি) আমি কি দুখেরে ডরাই ? (ভক্তের আকুতি) আমায় দেও মা তবিলদারী (ভক্তের আকুতি) এমন দিন কি হবে তারা (ভক্তের আকুতি)	ST	16	শাক্ত পদাবলী	Lecture, Discussion, Question and Answer
Total Class Hour		47		

Under CBCS System

Semester 5 (July – December 2021)

*BNGA DSE A (5-2) (*বাংলাদেশের সাহিত্য)

DSE A (5-2)	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ কথা সাহিত্য ক) সূর্য দীঘল বাড়ী - আবুইসহাক খ) প্যাপিরাস প্রকাশিত 'বাংলা দেশের (সাহিত্য)গল্প' গ্রন্থ থেকে নিচের গল্পগুলি পাঠ্য – আত্মজা ও একটি করবী গাছ – হাসানআজিজুল হক খোয়াই নদীর বাঁক বদল – সেলিমা হোসেন সুন্দর মানুষ – বিপ্রদাস বরুয়া যুগলবন্দি – আখতারুজ্জামান মহাকালের খাঁড়া – কায়েস আহমেদ	KK	20	কথা সাহিত্য	Lecture, Discussion, Question and Answer
মডিউল – ২ কবিতা ও নাটক ক) 'সপ্তর্ষি' প্রকাশিত 'বাংলা দেশের শ্রেষ্ঠ কবিতা' পাঠ্য কবিতাঃ স্বাধীনতা তুমি – শামসুর রহমান আমি কিংবদন্তীর কথা বলছি (অংশ)- আবুজাফর ও বাহদুল্লাহ সোনালি কাবিন ১৩ – আলমাহমুদ তোমাকে অভিবাদন, প্রিয়তমা, শহীদ কাদরী নগর ধ্বংসের আগে – রফিক আজাদ জুঁই ফুলের চেয়ে শাদা ভাতই অধিক সুন্দর মানুষ নির্মলেন্দুগুন – মহাদেব সাহা এবাদত নামা ১৩ – ফরহাদ মজহার তোমার দূরত্ব নিত্য আমার ক্রোধের দিনে – দায়ুদ হায়দার বাতাসে লাশের গন্ধ – রুদ্র মুহম্মদ শহিদুল্লাহ খ) কবর – মুনীর চৌধুরী	ST	10	কবিতা ও নাটক	Lecture, Discussion, Question and Answer
মডিউল – ৩ প্রবন্ধঃ অরুন সেন আবুল হাসনাত সম্পাঃ বাঙালি ও বাংলাদেশ (নয়া উদ্যোগ) গ্রন্থ থেকে নিম্নলিখিত প্রবন্ধগুলি পাঠ্য – অভিভাষণঃ মুহম্মদ শহীদুল্লাহ; বাঙালির আত্মপরিচয়ের সূত্রপাত – আবু জাফর সামসুদ্দিন; ভাষা সংস্কার ও বাঙালি চেতনার বিকৃতি – আহমদ	MB	15	প্রবন্ধ	Lecture, Discussion, Question and Answer

শরীফ; মুসলমানদের স্বদেশে প্রত্যাবর্তন – বদরুদ্দীন উমর; দ্বিজাতি তত্ত্বের সত্য মিথ্যা – সিরাজুল ইসলাম চৌধুরী; স্বরূপের সন্ধানে – আনিসুজ্জামান; বাংলাদেশ পালিয়ে বেড়ায় দৃষ্টি এড়ায় – হাসান আজিজুল হক; মার্চের স্বপ্ন – মুনতাসীর মামুন				
Total Class Hour		45		

Under CBCS System

Semester 5 (January – June 2021)

BNGA DSE A 6-3

(বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনী)

DSE A (5-2)	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ শজারুর কাঁটা – শরদিন্দু বন্দ্যোপাধ্যায়	AD	10	বাংলা গোয়েন্দা সাহিত্য	Lecture, Discussion, Question and Answer
মডিউল – ২ শঙ্কু সমগ্র (আনন্দ পাবলিকেশন) – সত্যজিৎ রায় পাঠ্য সমূহঃ ব্যোমযাত্রীর ডায়রি, প্রফেসর শঙ্কু ও গোলক রহস্য, প্রফেসর শঙ্কু ও রোবু, হিপনোজেন মহাকাশের দূত, শঙ্কু ও আদিম মানুষ, শঙ্কু ও ফ্র্যাঙ্কেনস্টাইন	ST	12	কল্পবিজ্ঞান আশ্রয়ী রচনা	Lecture, Discussion, Question and Answer
মডিউল – ৩ সব ভূতুড়ে – লীলা মজুমদার	KK	15	অলৌকিক কাহিনী	Lecture, Discussion, Question and Answer
Total Class Hour		37		

Under CBCS System

Semester 5 (July – December)

*BNGA DSE B (5-1) (*বাংলা শিশু ও কিশোর সাহিত্য)

DSE A (5-2)	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ • ক্ষীরের পুতুল – অবনীন্দ্রনাথ ঠাকুর • ঠাকুরমার ঝুলি – দক্ষিনারঞ্জন মিত্র মজুমদার পাঠ্য সমূহঃ কিরণমালা, সাতভাই চম্পা, সুখু আর দুখু	MB	10	বাংলা শিশু ও কিশোর সাহিত্য	Lecture, Discussion, Question and Answer
মডিউল – ২ আবোল তাবোল – সুকুমার রায় পাঠ্য সমূহঃ আবোল তাবোল, খিচুড়ি, সৎপাত্র, একুশে আইন, নারদ ! নারদ ! , গন্ধ বিচার ছড়া সমগ্র – অন্নদাশঙ্কর রায় পাঠ্য সমূহঃ লন্ডনের শীত, খুকু ও খোকা, পক্ষিরাজ, কাটাকুটি খেলা, অবাক চা পান, ঢাকাই ছড়া, সোনার হরিণ	KK	10	বাংলা শিশু ও কিশোর সাহিত্য	Lecture, Discussion, Question and Answer
মডিউল – ৩ বাদশাহী আংটি – সত্যজিৎ রায় সবুজ দ্বীপের রাজা – সুনীল গঙ্গোপাধ্যায়	ST	12	বাংলা শিশু ও কিশোর সাহিত্য	Lecture, Discussion, Question and Answer
Total Class Hour		32		

Under CBCS System

Semester 6 (January – June 2021)

*BNGA DSE B 6-4 (*লোক সংস্কৃতি ও লোক সাহিত্য)

DSE B 6-4	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ লোক সংস্কৃতি ও লোক সাহিত্যের সাধারন পরিচয় টাইপ ও মোটিফ ইনডেকস্ (বৈশিষ্ট্য ও প্রয়োগ শিক্ষার প্রাথমিক পাঠ) বাংলার ব্রত ও পার্বন (বিশেষ পাঠঃ পুন্যিপুকুর, মাঘ মণ্ডল, সঁজুতি)	AD	12	লোক সংস্কৃতির স্বরূপ	Lecture, Discussion, Question and Answer
মডিউল – ২ লোকছড়া, লোকনৃত্য (বিশেষ পাঠঃ ছৌ, রায়বেশে, গম্ভীরা) ধাঁধাঁ	 KK ST	 6 6	লোকছড়া ও লোকনৃত্য	Lecture, Discussion, Question and Answer
মডিউল – ৩ বাংলা প্রবাদ, লোকগান (বিশেষ পাঠঃ বাউল, ভাটিয়ালী, ভাওয়াইয়া) লোককথা	MB	12	বাংলা প্রবাদ / লোকগান / লোককথা	Lecture, Discussion, Question and Answer
Total Class Hour		36		

Under CBCS System

Semester 4 (January – June 2021)

*BNGA SEC B-4 (*ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতি বিজ্ঞান)

SEC B-4	**Teacher**	**Class Hour**	**Domain**	**Teaching Method**
মডিউল – ১ সংবাদপত্রে অথবা ব্যক্তিগতভাবে প্রচারের লক্ষ্যে প্রতিবেদন রচনা চিঠিপত্র রচনা – বিভিন্ন প্রকার সহ কাল্পনিক সাক্ষাৎকার রচনা	KK	10	প্রতিবেদন , চিঠিপত্র ও কাল্পনিক সাক্ষাৎকার	Lecture, Discussion, Question and Answer
মডিউল – ২ ছাপা মাধ্যম এবং বৈদ্যুতিন মাধ্যমের জন্য বিজ্ঞাপন রচনা অনুবাদের ভাষা ও শৈলী ইংরেজি থেকে বাংলা অনুবাদ	MB ST	8 5	বিজ্ঞাপন রচনা ও অনুবাদ	Lecture, Discussion, Question and Answer
মডিউল – ৩ গবেষণার রীতি ও নির্মাণ পদ্ধতি, গবেষণার আদর্শ বিন্যাসক্রম তথ্য সংগ্রহ, উদ্‌ধৃতির প্রয়োগ, কপিরাইট আইন পাদটীকা/ প্রান্তটীকা/ সূত্র নির্দেশ, গ্রন্থপঞ্জি ও নির্ঘন্ট প্রণয়ন বিধি	AD	10	গবেষণার রীতি ও নির্মাণ পদ্ধতি	Lecture, Discussion, Question and Answer
Total Class Hour		33		

Under CBCS System

Semester I (July 2019 – December 2019)

*BNGG CC/GE – I (*বাংলা সাহিত্যের ইতিহাস আধিনিক যুগ)

CC/GE- 1	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ গদ্য ও প্রবন্ধ শ্রীরামপুর মিশন, ফোর্ট উইলিয়াম কলেজ, রাজা রামমোহন রায়, ঈশ্বরচন্দ্র বিদ্যাসাগর, অক্ষয়কুমার দত্ত, প্যারীচাঁদ মিত্র, কালীপ্রসন্ন সিংহ, বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রবীন্দ্রনাথ ঠাকুর, প্রম্থ চৌধুরী, বুদ্ধদেব বসু	KK	12	গদ্য ও প্রবন্ধ	Lecture, Discussion, Question and Answer
মডিউল – ২ কাব্য, কবিতা ও নাটক ক) ঈশ্বরচন্দ্র গুপ্ত, রঙ্গলাল বন্দ্যোপাধ্যায়, মধুসূদন দত্ত, বিহারীলাল চক্রবর্তী, রবীন্দ্রনাথ ঠাকুর, কাজী নজরুল ইসলাম, যতীন্দ্রনাথ সেনগুপ্ত, জীবনানন্দ দাশ, সুভাষ মুখোপাধ্যায় খ) মধুসূদন দত্ত, দীনবন্ধু মিত্র, গিরিশচন্দ্র ঘোষ, রবীন্দ্রনাথ ঠাকুর, দ্বিজেন্দ্রলাল রায়, বিজন ভট্টাচার্য	MB	14	কাব্য, কবিতা ও নাটক	Lecture, Discussion, Question and Answer
মডিউল – ৩ উপন্যাস ও ছোটগল্প বাংলা উপন্যাসের উদ্ভব ও বিকাশ বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রবীন্দ্রনাথ ঠাকুর, শরৎচন্দ্র চট্টোপাধ্যায়, বিভূতিভূষণ বন্দোপাধ্যায়, তারাশঙ্কর বন্দোপাধ্যায়, মানিক বন্দোপাধ্যায়	ST	12	উপন্যাস ও ছোটগল্প	Lecture, Discussion, Question and Answer
Total Class Hour		38		

Under CBCS System

Semester II (January 2019 – June 2019)

*BNGG CC / GE – 2 (*ঐতিহাসিক ভাষাবিজ্ঞান, ছন্দ ও অলঙ্কার)

BNGG CC/GE- 2	**Teacher**	**Class Hour**	**Domain**	**Teaching Method**
মডিউল – ১ ঐতিহাসিক ভাষাবিজ্ঞান প্রাচীন ভারতীয় আর্যভাষা থেকে আধুনিক ভারতীয় আর্যভাষা হিসেবে বাংলা ভাষা উদ্ভবের গতিরেখা আদি-মধ্য বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষন – প্রেক্ষিত শ্রীকৃষ্ণকীর্তন	ST	12	ঐতিহাসিক ভাষাবিজ্ঞান	Lecture, Discussion, Question and Answer
মডিউল – ২ ছন্দ অক্ষ্র, দল, কলা, মাত্রা, যতি, পর্ব, পদ, পঙক্তি / চরণ – সংজ্ঞা ও উদাহরণসহ প্রতিটির ধারনা বাংলা ছন্দের ত্রিধারা – সংজ্ঞা, বৈশিষ্ট্য ও উদাহরণ ছন্দোলিপি প্রনয়ন (পর্ব, পদ, পঙক্তি, লয়, মাত্রা ও রীতির উল্লেখ বাঞ্ছনীয়)	KK	15	ছন্দ	Lecture, Discussion, Question and Answer
মডিউল – ৩ অলংকার অলংকার সম্পর্কে সাধারণ ধারনা অনুপ্রাস, যমক, শ্লেষ, বক্রোক্তি, উপমা, রূপক, উৎপ্রেক্ষা, সমাসোক্তি, ব্যাজস্তুতি, ব্যতিরেক – সংজ্ঞা ও উদাহরণসহ অলংকার নির্ণয়	AD	15	অলঙ্কার	Lecture, Discussion, Question and Answer
Total Class Hour		42		

Under CBCS System

Semester 3 (July 2019 – December 2019)

*BNGG CC / GE – 3 (*বাংলা কাব্য কবিতা ও নাটক)

CC/GE - 3	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ বৈষ্ণব পদাবলী (কঃ বিঃ সংস্করণ) নির্বাচিত পদসমূহঃ নীরদ নয়নে নীর ঘন সিঞ্চনে আজু হাম কি পেখলু নবদ্বীপ চন্দ দঁড়াইয়া নন্দের আগে গোপাল কান্দে অনুরাগে ঘরের বাহিরে দন্ডে শতবার রূপ লাগি আখি ঝুরে গুনে মন ভোর এমন পীরিতি কভু নাহি দেখি শুনি সখি কি পুছসি অনুভব মোয় কণ্টক গাড়ি কমলসম পদতল মন্দির বাহির কঠিন কপাট কি মোহিনী জান বঁধু কি মোহিনী জান বঁধু তুমি যে আমার প্রান অঙ্কুর তপন তাপে যদি জারব বহুদিন পরে বঁধুয়া এলে তাতল সৈকত বারিবিন্দুসম	KK	12	বৈষ্ণব পদাবলী	Lecture, Discussion, Question and Answer
মডিউল – ২ ক) 'পুনশ্চ' – রবীন্দ্রনাথ ঠাকুর নির্বাচিত কবিতা – ছেলেটা, সাধারণ মেয়ে, বাঁশি , প্রথম পূজা খ) একালের কবিতা সঞ্চয়ন (কঃ বিঃ সংস্করণ) নির্বাচিত কবিতা – নষ্টনীড় – সমর সেন আমার ভারতবর্ষ – বীরেন্দ্র চট্টোপাধ্যায় দেশ দেখাচ্ছ অন্ধকারে – নীরেন্দ্রনাথ চক্রবর্তী কেউ কথা রাখেনি –সুনীল গঙ্গোপাধ্যায়	AD MB	6 6	পুনশ্চ একালের কবিতা সঞ্চয়ন	Lecture, Discussion, Question and Answer
মডিউল – ৩ বাংলা নাটক রাজা ও রানী – রবীন্দ্রনাথ ঠাকুর	MB	13	বাংলা নাটক	Lecture, Discussion, Question and Answer
Total Class Hour		36		

Under CBCS System

Semester 4 (January – June 2021)

*BNGG CC / GE – 4 (*বাংলা কথা সাহিত্য ও প্রবন্ধ)

CC/GE- 4	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ উপন্যাস পল্লীসমাজ – শরৎচন্দ্র চট্টোপাধ্যায়	ST	16	উপন্যাস	Lecture, Discussion, Question and Answer
মডিউল – ২ ছোটগল্প একালের ছোটগল্প সঞ্চয়ন – (কঃ বিঃ সংস্করন) পাঠ্য ঃ পুঁইমাচা – বিভূতিভূষন বন্দ্যোপাধ্যায় না – তারাশঙ্কর বন্দ্যোপাধ্যায় হারানের নাতজামাই – মানিক বন্দ্যোপাধ্যায় অশ্বমেধের ঘোড়া – দীপেন্দ্রনাথ বন্দ্যোপাধ্যায় মতিলাল পাদরী – কমলকুমার মজুমদার ছিন্নমস্তা – আশাপূর্ণা দেবী	KK MB	6 6	ছোটগল্প	Lecture, Discussion, Question and Answer
মডিউল – ৩ প্রবন্ধ সংকলন –রবীন্দ্রনাথ ঠাকুর পাঠ্য প্রবন্ধ সমূহ ঃ শিক্ষার মিলন, পূর্ব ও পশ্চিম, মেঘদূত, কেকাধ্বনি	AD	8	প্রবন্ধ	Lecture, Discussion, Question and Answer
Total Class Hour		36		

Under CBCS System

Semester 5 (July 2021 – December 2021)

***BNGG DSE A (5-2) (*বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনী)**

DSE A (5-2)	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ শজারুর কাঁটা – শরদিন্দু বন্দ্যোপাধ্যায়	ST	12	বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনী	Lecture, Discussion, Question and Answer
মডিউল – ২ শঙ্কু সমগ্র (আনন্দ পাবলিকেশন) – সত্যজিৎ রায় পাঠ্য সমূহঃ ব্যোমযাত্রীর ডায়রি, প্রফেসর শঙ্কু ও গোলক রহস্য, প্রফেসর শঙ্কু ও রোবু, হিপনোজেন মহাকাশের দূত, শঙ্কু ও আদিম মানুষ, শঙ্কু ও ফ্র্যাঙ্কেনস্টাইন	MB	12	বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনী	Lecture, Discussion, Question and Answer
মডিউল – ৩ সব ভূতুড়ে – লীলা মজুমদার	KK	12	বাংলা গোয়েন্দা সাহিত্য, কল্পবিজ্ঞান আশ্রয়ী রচনা এবং অলৌকিক কাহিনী	Lecture, Discussion, Question and Answer
Total Class Hour		36		

Under CBCS System

Semester 6 (January – June 2021)

*BNGG DSE B 6-2 (*লোক সংস্কৃতি ও লোক সাহিত্য)

DSE B 6-2	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ লোক সংস্কৃতি ও লোক সাহিত্যের সাধারন পরিচয় টাইপ ও মোটিফ ইনডেকস্ (বৈশিষ্ট্য ও প্রয়োগ শিক্ষার প্রাথমিক পাঠ) বাংলার ব্রত ও পার্বন (বিশেষ পাঠঃ পুন্যিপুকুর, মাঘ মণ্ডল, সঁজুতি)	AD	15	লোক সংস্কৃতির স্বরূপ	Lecture, Discussion, Question and Answer
মডিউল – ২ লোকছড়া, লোকনৃত্য (বিশেষ পাঠঃ ছৌ, রায়বেশে, গম্ভীরা) ধাঁধাঁ	KK ST	5 8	লোকছড়া ও লোকনৃত্য	Lecture, Discussion, Question and Answer
মডিউল – ৩ বাংলা প্রবাদ, লোকগান (বিশেষ পাঠঃ বাউল, ভাটিয়ালী, ভাওয়াইয়া) লোককথা	MB	10	বাংলা প্রবাদ / লোকগান / লোককথা	Lecture, Discussion, Question and Answer
Total Class Hour		38		

Under CBCS System

Semester 4 (January – June 2021)

*BNGG LCC – 2 (*বাংলা ভাষাবিজ্ঞান, সাহিত্যের রূপভেদ ও কাব্য)

LCC 2	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ বাংলা ভাষাবিজ্ঞান বাংলা শব্দভান্ডার বাংলা শব্দার্থ পরিবর্তনের ধারা বাংলা ভাষার ধ্বনি পরিবর্তনের রীতি ও প্রকৃতি	KK	12	বাংলা ভাষাবিজ্ঞান	Lecture, Discussion, Question and Answer
মডিউল – ২ সাহিত্যের রূপভেদ মহাকাব্য, গীতিকবিতা, ট্রাজেডি, কমেডি, পৌরানিক নাটক, ঐতিহাসিক নাটক, সামাজিক নাটক সাহিত্যের রূপভেদঃ রোমান্স ও উপন্যাস সামাজিক উপন্যাস ও ঐতিহাসিক উপন্যাস, ছোটগল্পের সঙ্গে উপন্যাসের তুলনা, প্রবন্ধ ও সাহিত্য সমালোচনা	MB KK ST	10 6 4	সাহিত্যের রূপভেদ	Lecture, Discussion, Question and Answer
মডিউল – ৩ কাব্য মেঘনাদবধ কাব্য – মাইকেল মধুসূদন দত্ত	AD	15	কাব্য	Lecture, Discussion, Question and Answer
Total Class Hour		47		

Under CBCS System

Semester III (July – December 2021)

BNGG SEC – A (মুদ্রণ ও প্রকাশনা)

HONS / GEN কোর্সের ছাত্র ছাত্রীরা যৌথভাবে পড়বে / Class করবে

SEC A	Teacher	Class Hour	Domain	Teaching Method
মডিউল – ১ • পান্ডুলিপি প্রস্তুতি • বাংলা যুক্তাক্ষরের ধারণা • সংগ্রহ – সম্পাদনা ও সংকলন সম্পর্কে ধারনা • কভার টাইটেল পেজ • গ্রন্থ / পত্রিকার পঞ্জিকরন সংক্রান্ত ধারণা	KK	10	মুদ্রণ ও প্রকাশনা	Lecture, Discussion, Question and Answer
মডিউল – ২ • এম.এস.ওয়ার্ড, পেজ মেকার • কোরেল ড্র, ইনডিজাইন	MB	10	মুদ্রণ ও প্রকাশনা	Lecture, Discussion, Question and Answer
মডিউল – ৩ • প্রুফ সংশোধন, ছাপার প্রযুক্তি • স্টিচিং, বাইন্ডিং, মার্কেটিং সম্পর্কিত ধারনা	ST	10	মুদ্রণ ও প্রকাশনা	Lecture, Discussion, Question and Answer
Total Class Hour		30		

Under CBCS System

Semester 4 (January – June 2021)

*BNGG SEC B-4/6-1 (*ব্যবহারিক বাংলা ও সাহিত্য গবেষণার পদ্ধতি বিজ্ঞান)

SEC B-4/6	**Teacher**	**Class Hour**	**Domain**	**Teaching Method**
মডিউল – ১ সংবাদপত্রে অথবা ব্যক্তিগতভাবে প্রচারের লক্ষ্যে প্রতিবেদন রচনা চিঠিপত্র রচনা – বিভিন্ন প্রকার সহ কাল্পনিক সাক্ষাৎকার রচনা	KK		প্রতিবেদন, চিঠিপত্র ও কাল্পনিক সাক্ষাৎকার রচনা	Lecture, Discussion, Question and Answer
মডিউল – ২ ছাপা মাধ্যম এবং বৈদ্যুতিন মাধ্যমের জন্য বিজ্ঞাপন রচনা অনুবাদের ভাষা ও শৈলী ইংরেজি থেকে বাংলা অনুবাদ	MB ST		বিজ্ঞাপন রচনা ও অনুবাদ	Lecture, Discussion, Question and Answer
মডিউল – ৩ গবেষণার রীতি ও নির্মাণ পদ্ধতি, গবেষণার আদর্শ বিন্যাসক্রম তথ্য সংগ্রহ, উদ্‌ধৃতির প্রয়োগ, কপিরাইট আইন পাদটীকা/ প্রান্তটীকা/ সূত্র নির্দেশ, গ্রন্থপঞ্জি ও নির্ঘন্ট প্রণয়ন বিধি	AD		গবেষণার রীতি ও নির্মাণ পদ্ধতি	Lecture, Discussion, Question and Answer
Total Class Hour				

PHILOSOPHY(HONS) CBCS –SYSTEM TEACHING PLAN

(2020-2021)

SEMESTER-1

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	INDIAN PHILOSOPHY-I	CC-1 (C, D, G)	30	30
	HISTORY OF WESTERN PHILOSOPHY-I	CC-2 (B, C, E)	30	30
SUJATA DHAR	INDIAN PHILOSOPHY-I	CC-1 (E, F)	25	25
	HISTORY OF WESTERN PHILOSOPHY-I	CC-2 (F, G)	28	28
RATNA BANERJEE	INDIAN PHILOSOPHY-I	CC-1 (A, B)	12	12
	HISTORY OF WESTERN PHIOSOPHY-I	CC-2 (A, D)	16	16

SEMESTER- 2

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	OUTLINES OF INDIAN PHILOSOPHY-II	CC-3 (D, E)	30	30
	HISTORY OF WESTERN PHILOSOPHY-II	CC-4 (A, B)	30	30
SUJATA DHAR	OUTLINES OF INDIAN PHILOSOPHY-II	CC-3 (B, C)	30	30
	HISTORY OF WESTERN PHILOSOPHY-II	CC-4 (D)	30	30
RATNA BANERJEE	OUTLINES OF INDIAN PHILOSOPHY-II	CC-3 (A)	20	20
	HISTORY OF WESTERN PHILOSOPHY-II	CC-4 (C)	20	20

SEMESTER- 3

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	PHILOSOPHY OF MIND	CC-5	35	35
	LOGICAL REASONING & APPLICATION (SEC)	WESTERN	26	26
SUJATA DHAR	SOCIAL AND POLITICAL PHILOSOPHY	CC-6	35	35
	LOGICAL REASONING & APPLICATION (SEC)	INDIAN	26	26
RATNA BANERJEE	PHILOSOPHY OF RELIGION	CC-7	35	35

SEMESTER- 4

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	WESTERN LOGIC- I	CC-8	35	35
	PHILOSOPHY OF HUMAN RIGHTS (SEC)	A, B, C, D	30	30
SUJATA DHAR	WESTERN LOGIC- II	CC-9	35	35
	PHILOSOPHY OF HUMAN RIGHTS (SEC)	E, F, G	30	30
RATNA BANERJEE	EPISTEMOLOGY AND METAPHYSICS	CC-10	35	35

SEMESTER- 5

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	ETHICS (INDIAN)	CC-12 (A, B, F)	35	35
	AN ENQUIRY CONCERNING HUMAN UNDERSTANDING (DSE)	HUME	30	30
SUJATA DHAR	NYAYA LOGIC & EPISTEMOLOGY	CC-11 (A, B)	35	35
	PHILOSOPHY OF LANGUAGE (DSE)	INDIAN	30	30
RATNA BANERJEE	NYAYA LOGIC & EPISTEMOLOGY	CC-11 (C, D, E)	35	35

PHILOSOPHY(GENERAL) CBCS –SYSTEM TEACHING PLAN

(2018-2020)

SEMESTER-1

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	INDIAN EPISTEMOLOGY & METAPHYSICS	VAISESIKA & VEDANTA	28	28
SUJATA DHAR	INDIAN EPISTEMOLOGY & METAPHYSICS	NYAYA	20	20
RATNA BANERJEE	INDIAN EPISTEMOLOGY & METAPHYSICS	CARVAKA	8	8

SEMESTER-2

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	WESTERN EPISTEMOLOGY & METAPHYSICS	REALISM & MIND BODY	26	26
SUJATA DHAR	WESTERN EPISTEMOLOGY & METAPHYSICS	KANT & CAUSALITY	20	20
RATNA BANERJEE	WESTERN EPISTEMOLOGY & METAPHYSICS	KNOWLEDGE	14	14

SEMESTER-3

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	WESTERN LOGIC	A, B	24	24
	LOGICAL REASONING & APPLICATION (SEC)	WESTERN	26	26
SUJATA DHAR	WESTERN LOGIC	C, D	20	20
	LOGICAL REASONING & APPLICATION (SEC)	INDIAN	26	26
RATNA BANERJEE	WESTERN LOGIC	E, F	16	16

SEMESTER- 4

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	PHILOSOPHY OF MIND	B, C	27	27
	MAN, AND ENVIRONMENT	C, D, E	35	35
SUJATA DHAR	PHILOSOPHY OF MIND	D	13	13
RATNA BANERJEE	PHILOSOPHY OF MIND	A	20	20
	MAN, AND ENVIRONMENT	A, B	35	35

SEMESTER- 5

NAME OF FACULTY	TOPIC	SUB-TOPIC	CLASSES	HOURS
SIPRA GANGULY	SOCIAL AND POLITICAL PHILOSOPHY (DSE)	B	30	30
SUJATA DHAR	SOCIAL AND POLITICAL PHILOSOPHY (DSE)	A	30	30
RATNA BANERJEE	BUSINESS ETHICS (SEC)	A & B	30	30

DEPARTMENT OF EDUCATION

TEACHING PLAN

Academic Session 2020-2021

Under CBCS System

Semester 1(July-December)

CC – 1

Introduction to Education

CC-1	***Teacher***	***Class Hour/ Domain***	***Teaching Method***
Unit- I = Concept of Education • *Narrow and broader concept of education* • *Meaning, nature and scope of education.* • *Aims of education – individual, social, vocational and democratic.* • *Aims of modern education with special reference to Delor's Commission.*	***RJ***	***2*** ***3*** ***4*** ***6*** *Cognit* *ive* *Effecti*	***Heuristic Method***

		ve	
Unit- 2 = Factors of Education • *Child / learner: influence of heredity and environment on the learner* • *Teacher: qualities and duties of a good teacher* • *Curriculum- concept and types* • *Co-curricular activities: meaning, values and significance* • *Educational institutions: informal, formal and non-formal, their interrelation*	***SKN***	***2*** ***2*** ***2*** ***3*** ***6*** ***Cogniti ve Effecti ve***	***Heuristic Method***

Unit- 3 = Agencies of Education • *Home* • *School* • *State* • *Mass-media- television, radio, cinema and newspaper*	**TKD**	*2* *2* *2* *4* ***Effective***	***Heuristic Method***

Unit- 4 = Child Centricism and Play-way in Education *Concept of child centricism in education* *Characteristics and significance of child centricism in education* *Concept of play and work.* *Characteristics of play way in Education, Kindergarten, Montessori, Project method.*	***SRB***	***1*** ***3*** ***3*** ***6*** ***Cogniti ve Effecti ve***	***Participat ory Method***
	Total class hour	***53***	

CC – 2
History of Indian Education

CC-2	***Teacher***	***Class Hour/ Domain***	***Teachi ng Metho d***
Unit: 1 = Education in India during ancient and medieval period • *Vedic (aim, curriculum, teaching method, teacher pupil relation)* • *Brahmanic (aim, curriculum, teaching method, teacher-pupil relation)* • *Buddhist (aim, curriculum, teaching method, teacher pupil relation)* • *Islamic (aim, curriculum, teaching method, teacher pupil relation)*	**RJ**	***4*** ***4***	***Heuristic Interac tiv e***

		4 ***4*** ***Cognitive*** ***Effective***	***Story telling*** ***Method***
Unit: 2 = Education in India during British period (1800- 1853) • *Sreerampore trio and their contribution in the field of education* • *Charter Act, Oriental-occidental controversy* • *Macaulay Minute and Bentinck's resolution* • *Adam's report*	***SRB***	***3*** ***2*** ***3*** ***3*** ***Cognitive*** ***Effective***	***Heuristic*** ***Demonstration*** ***Method***
Unit: 3 = Education in India during British period (1854- 1946) • *Woods Despatch, Hunter Commission* • *Curzon policy regarding primary, secondary and higher education,* • *National education movement (cause and effect)* • *Basic education (concept and development)* • *Sadler Commission*	***TKD***	***4*** ***4*** ***3*** ***4*** ***3*** ***Cognitive***	***Heuristic*** ***Story telling*** ***Method***

• ***Unit: 4 = Education in India after independence*** *Radhakrishnan Commission (aim, curriculum of higher education, rural university)* • *Mudaliar Commission (aim, structure and curriculum of secondary education)* • *Kothari Commission (aim, structure and curriculum of primary and secondary education)* • *National Policy of Education, 1986, POA 1992.*	***SKN***	***4*** ***3*** ***6*** ***4*** ***Effective***	***Discussion Method***
Total class hour		***60***	

(Semester 3)
CC – 5
Sociological Foundation of Education

CC-5	***Teacher***	***Class Hour/ Domain***	***Teaching Method***

Unit-I = Introductory Concept of Sociology of Education • *Meaning and definition of Sociology of Education* • *Relation between Sociology and Education* • *Nature of Sociology of Education* • *Scope of Sociology of Education*	***RJ***	***3*** ***2*** ***2*** ***2*** ***Cogniti ve Effecti ve***	***Discussion Interactive Method***
Unit-2 = Social Groups • *Social Groups : meaning and definition* • *Types of Social groups – Primary, Secondary and Tertiary* • *Socialization Process: Concept* • *Role of the family and school in Socialization process*	***SKN***	***2*** ***6*** ***1*** ***3*** ***Cogniti ve Effecti ve***	***Interactive Participatory Method***
Unit-3 = Social Change and Education • *Concept of Social Change* • *Interrelation between Social change and Education* • *Social stratification and Social Mobility* • *Social interaction Process*	***TKD***	***2*** ***2*** ***4*** ***2*** ***Cogniti ve Effecti ve***	***Demonstrati on Method***

Unit-4 = Social Communication in Education • *Social Communication : Concept* • *Informal agencies of social communication* • *Inter relation between Culture, religion and Education.* • *Inter relation between Technology, Economy and Education.*	***SRB***	***2*** ***4*** ***4*** ***4*** ***Cogniti ve Effecti ve***	***Demonstrati on Participator y Method***
Total class hour		***45***	

CC – 6 (Semester 3)
Educational Organization, Management and Planning

CC-6	***Teacher***	***Class Hour/ Domain***	***Teaching Method***

Unit: 1 = Organization and Management *Concept of organization* *Concept of management* *Concept of educational organization* *Concept of school organization*	***RJ***	***3*** ***3*** ***3*** ***3*** ***Cogniti ve Effecti ve***	***Discussion Method***
Unit: 2 = Educational organization *Meaning of school plant* *Elements of school plant (concepts only)* *Features of library and time-table* *Features of school medical services, workshop, computer laboratory.*	***SRB***	***2*** ***3*** ***3*** ***4*** ***Effective***	***Demonstrati on Method***

Unit: 3 = Educational Management *Meaning of educational management* *Objectives of educational management* *Types of educational management* *Significance of educational management*	***SKN***	***2*** ***2*** ***4*** ***3*** ***Effective***	***Demonstrati on Method***

Unit:4 = Educational Planning *Meaning of educational planning* *Aims and objectives of educational* *planning Steps of educational planning* *Types and significance of educational planning*	***TKD***	***2*** ***2*** ***3*** ***5*** ***Cogniti*** ***ve*** ***Effecti*** ***ve***	*Participatory* ***Method***
Total class hour		***47***	

CC – 7 (Semester 3)
Guidance and Counselling

CC-7	***Teacher***	***Class hour***	***Teaching Method***
Unit I = Guidance – Meaning, Functions, ***Need*** *Guidance – Meaning, Definitions and* *Function* *Individual Guidance – Meaning, advantages and disadvantages*	***RJ***	***3*** ***3*** ***3***	***Interactive***

Group Guidance – Meaning and Advantages and disadvantages *Need for guidance in secondary schools and requisites of a good school guidance programme.*		***3*** ***3*** ***Cognitive*** ***Effective***	***Participat*** ***ory Role*** ***Playing*** ***Method***

Unit 2 = Guidance - Educational, Vocational, Personal *Educational Guidance- Meaning, Function at different stages of Education* *Vocational Guidance- Meaning, Function at different stages of Education* *Personal Guidance- Meaning, Importance for the Adolescence*	***SKN***	***6*** ***6*** ***3*** ***Effective***	***Interactive Participatory Role Playing Method***
Unit 3 = Counselling – Meaning, Techniques, ***Types** Counselling - – Meaning, importance and Scope* *Techniques of Counselling- Directive, Non-Directive, Eclectic* *Individual and Group Counselling –Meaning , Importance*	***SRB***	***4*** ***6*** ***4*** ***Effective*** ***Emotional***	***Role Playing Method***
Unit 4 = Basic data necessary for Guidance *Tools for collecting information on pupil: Intelligence: Concept and Test, Personality:* *Concept and Test, Aptitude: Concept and Test* *Cumulative Record Card* *Anecdotal Record Card*	***TKD***	***9*** ***2*** ***2*** ***Effective***	***Discussion Interactive Method***
	Total class hour	***57***	

Semester – 3

SEC – A2

Skill for Democratic Citizenship

SEC-A2	***Teacher***	***Class hour***	***Teaching Method***

Unit 1: Rights and duties in Indian Constitution • *Democratic rights* • *Fundamental Rights* • *Duties of citizenship*	***SKN***	*4* *4* *4*	*Lecture* *Demonstrati on* *Interactive*
Unit 2 = Protection of Children • *Child protection - concept and need.* • *Child Rights – concept, classification and need* • *Legal actions –POCSO*	***SKN***	***4*** ***4*** ***4***	*Lecture* *Demonstrati on* *Interactive*
Unit 3 = Domestic Harmony • *Domestic violence – definition and types* • *Protection of Women from Domestic Violence Act, 2005 – basic features* • *Protection of males in DVA 2005*	***SRB***	***4*** ***4*** ***4***	*Heuristic* *Story telling*
Unit 4 = Role of Education to ensure: • *Rights and duties in Indian Constitution* • *Protection of Children* • *Democratic harmony*	***SRB***	***4*** ***4*** ***4***	*Heuristic* *Story telling*
	Total class hour	***48***	

EDUCATION GENERAL 2020-2021

CC – 1
Introduction to Education

CC-1	***Teacher***	***Class Hour/ Domain***	***Teaching Method***
Unit- I = Concept of Education • *Narrow and broader concept of education* • *Meaning, nature and scope of education.* • *Aims of education – individual, social, vocational and democratic.* • *Aims of modern education with special reference to Delor's Commission.*	***RJ***	***2*** ***3*** ***4*** ***6*** *Cognit ive Effecti ve*	***Heuristic Method***
Unit- 2 = Factors of Education • *Child / learner: influence of heredity and environment on the learner* • *Teacher: qualities and duties of a good teacher* • *Curriculum- concept and types* • *Co-curricular activities: meaning, values and significance* • *Educational institutions: informal, formal and non-formal, their interrelation*	***SKN***	***2*** ***2*** ***2*** ***3*** ***6*** ***Cogniti ve Effecti ve***	***Heuristic Method***

Unit- 3 = Agencies of Education • *Home* • *School* • *State* • *Mass-media- television, radio, cinema and newspaper*	**TKD**	*2* *2* *2* *4* ***Effective***	***Heuristic Method***
Unit- 4 = Child Centricism and Play-way in Education *Concept of child centricism in education* *Characteristics and significance of child centricism in education* *Concept of play and work.* *Characteristics of play way in Education, Kindergarten, Montessori, Project method.*	***SRB***	***1*** ***3*** ***3*** ***6*** ***Cogniti ve Effecti ve***	***Participat ory Method***
	Total class hour	***53***	

CC3/GE3 SEM-3
Sociological Foundation of Education

CC-5	***Teacher***	***Class Hour/ Domain***	***Teaching Method***

Unit-I = Introductory Concept of Sociology of Education • *Meaning and definition of Sociology of Education* • *Relation between Sociology and Education* • *Nature of Sociology of Education* • *Scope of Sociology of Education*	***RJ***	***3*** ***2*** ***2*** ***2*** ***Cogniti ve Effecti ve***	***Discussion Interactive Method***
Unit-2 = Social Groups • *Social Groups : meaning and definition* • *Types of Social groups – Primary, Secondary and Tertiary* • *Socialization Process: Concept* • *Role of the family and school in Socialization process*	***SKN***	***2*** ***6*** ***1*** ***3*** ***Cogniti ve Effecti ve***	***Interactive Participatory Method***
Unit-3 = Social Change and Education • *Concept of Social Change* • *Interrelation between Social change and Education* • *Social stratification and Social Mobility* • *Social interaction Process*	***TKD***	***2*** ***2*** ***4*** ***2*** ***Cogniti ve Effecti ve***	***Demonstrati on Method***

Unit-4 = Social Communication in Education • *Social Communication : Concept* • *Informal agencies of social communication* • *Inter relation between Culture, religion and Education.* • *Inter relation between Technology, Economy and Education.*	***SRB***	***2*** ***4*** ***4*** ***4*** ***Cogniti*** ***ve*** ***Effecti*** ***ve***	***Demonstrati*** ***on*** ***Participator*** ***y*** ***Method***
	Total class hour	***45***	

SEC – A2 SEM-3/5

Skill for Democratic Citizenship

SEC-A2	***Teacher***	***Class hour***	***Teaching Method***
<u>Unit 1: Rights and duties in Indian Constitution</u> • *Democratic rights* • *Fundamental Rights* • *Duties of citizenship*	***SKN***	*4* *4* *4*	*Lecture* *Demonstrati on* *Interactive*
<u>Unit 2 = Protection of Children</u> • *Child protection - concept and need.* • *Child Rights – concept, classification and need* • *Legal actions –POCSO*	***SKN***	***4*** ***4*** ***4***	*Lecture* *Demonstrati on* *Interactive*
<u>Unit 3 = Domestic Harmony</u> • *Domestic violence – definition and types* • *Protection of Women from Domestic Violence Act, 2005 – basic features* • *Protection of males in DVA 2005*	***SRB***	***4*** ***4*** ***4***	*Heuristic* *Story telling*

Unit 4 = Role of Education to ensure: • *Rights and duties in Indian Constitution* • *Protection of Children* • *Democratic harmony*	***SRB***	***4*** ***4*** ***4***	*Heuristic* *Story telling*
	Total class hour	***48***	

TEACHING PLAN PHYSIOLOGY (JAN – JUNE/ EVEN SEMESTER 2020)

NAME OF TEACHER	CLASSES/COURSES	THEORY	PRACTICAL
MADHUMITA DEBNATH (FTT)	2Nd SEM HONS/CC	Nervous system, Molecular Biology	CC3P
	4th SEM HONS/CC	Nutrition & Dietatics	CC8P
	4th SEM HONS/SEC	Detection of Food additives(SEC B)	
	4th SEM GEN/CC	Endocrine Physiology	
DHRUBA SAUTYA (SACT)	2nd SEM HONS/CC	Muscle Physiology	
	4th SEM HONS/CC	Digestion	
	2nd SEM GEN/CC	Respiration	CC2P/GEN
	4th SEM GEN/CC	Reproduction	CC4P/GEN
	4th SEM GEN/SEC	Community Health (SEC-B)	
Guest Teacher 1 (Vacant)	2nd SEM HONS/CC	Cell Signalling	
	4th SEM HONS/CC	Metabolism	CC9P and CC10P
	2nd SEM GEN/CC	Blood	
	4th SEM GEN/CC	Excretory System	CC4P/GEN
GuestTeacher 2 (vacant)	2nd SEM HONS/CC	Nerve Physiology	CC4P
	4th SEM HONS/CC	Molecular Biology	
	4th SEM HONS/SEC	Detection of Food additives(SEC B)	
	2nd SEM GEN/CC	Cardiovascular system	CC2P/GEN
	4th SEM GEN/CC	Endocrine Physiology	
Guest Teacher 3 (Vacant)	2nd SEM Hons		CC3P and CC4P
	4th SEM Hons		CC8P, CC9P & CC10P

TEACHING PLAN FOR JULY-DEC /ODD SEMESTER 2020

DEPARTMENT OF PHYSIOLOGY

DR KANAILAL BHATTACHARYYA COLLEGE

NAME OF TEACHER	CLASSES/COURSES	THEORY	PRACTICAL
MADHUMITA DEBNATH (FTT)	1ST SEM HONS/CC	Enzyme, Biochemistry (CHO and Lipid)	CC2P
	3rd SEM HONS/CC	Blood and body fluids (1st part; till blood transfusion)	CC5P
	3rd SEM HONS/SEC	Hematology (SEC A; 1st part; till Glycated Hb)	
	5th SEM HONS/CC	Special senses (2nd part; olfaction and gustation)	CC11P
	5th SEM HONS/DSE	Biostatistics/ DSE A1	DSE A1/P
	5th SEM GEN/SEC	Micrbiology & Immunology (SEC A1)	
DHRUBA SAUTYA (SACT)	1ST SEM HONS/CC	Cellular basis of physiology	
	3rd SEM HONS/CC	Respiratory system	
	5th SEM HONS/CC	Special senses (1st part; till Hearing)	
	5th SEM HONS/DSE	Work & sports phys (DSE B1) (1st part; till work org.)	
	1st SEM GEN/CC	Cellular basis of physiology (1st part; till enzyme.)	CC1P;Biochem,
	3rd SEM GEN/CC	Special senses	CC3P, hum exp.
	3rd SEM GEN/SEC	Micrbiology & Immunology (SEC A1)	
	5th SEM GEN/DSE	Haematology (DSE A2)	
ANANYA ADHIKARY (Lab demonstrator cum Curricular Instructor)	1ST SEM HONS/CC	Biophysical principles	
	3rd SEM HONS/CC	Cardiovascular system (2nd part; VMC to end)	CC6P & CC7P
	5th SEM HONS/CC	Endocrinology (2nd part, adrenal cortex to end)	11P & 12P
	1st SEM GEN/CC	Digestion and metabolism	
	3rd SEM GEN/CC	Nervous system	CC3P, Histology
	5th SEM GEN/DSE	------	DSE A2P,Haematol
SHILPA DUTTA (Lab demonstrator cum Curricular Instructor)	1ST SEM HONS/CC	Biochemistry (Protein and nucleic acid)	CC1P, Histology.
	3rd SEM HONS/CC	Cardiovascular system (1st part; till the pulse)	
	3rd SEM HONS/SEC	Hematology (SEC A; 2nd part; CRP to end)	
	5th SEM HONS/CC	Endocrinology (1st part, till parathyroid)	
	5th SEM HONS/DSE	Work & sports phys (DSE B1) (2nd part; Phy fit to end)	DSE B1/P
	1st SEM GEN/CC	Biochemistry(CHO to nucleic acid)	CC1P, hist & Titratn
	3rd SEM GEN/CC	Nerve muscle physiology	

TEACHING PLAN / APR-SEP EVEN SEMESTER 2021

DEPARTMENT OF PHYSIOLOGY

DR KANAILAL BHATTACHARYYA COLLEGE

NAME OF TEACHER	CLASSES/COURSES	THEORY	PRACTICAL
MADHUMITA DEBNATH (FTT)	2ND SEM HONS/CC	CC4-Molecular neurobiology and Brain, limbic system.	
	4TH SEM HONS/CC	CC8-Metabolism up to Lipid, CC10-Nutrition up to BMR.	CC8, CC9,CC10

	4TH SEM HONS/SEC	SEC-B1- Detection of Food additives.	
	6TH SEM HONS/CC	CC14- Environmental pollution.	CC13P, CC14P
	6TH SEM HONS/DSE	DSE B3- Chronobiology and stress physiology.	DSE B3 P
	4TH SEM GEN/ SEC	SEC B2 -Community and public health	
	5th SEM GEN/SEC	SEC B2 -Community and public health	
DHRUBA SAUTYA (SACT)	2ND SEM HONS/CC	CC3- Muscle physiology	
	4TH SEM HONS/CC	CC8- Digestion, CC10-Dietetics till end	
	6TH SEM HONS/CC	CC13- Reproductive and developmental biology.	
	2ND SEM GEN/CC	CC2- Respiratory system, blood and body fluids.	
	4TH SEM GEN/CC	CC4- Reproductive and excretory physiology.	CC4P
	6TH SEM GEN /DSE	----------	DSE P only.
ANANYA ADHIKARY (Lab demonstrator cum Curricular Instructor)	2ND SEM HONS/CC	CC3-Cell signaling and nerve physiology	
	4TH SEM HONS/CC	CC9- Methodologies.	
	6TH SEM HONS/CC	CC13-Excretory system.	
	2ND SEM GEN/CC	----------	CC2P only
	4TH SEM GEN/CC	Endocrinology.	
	6TH SEM GEN/DSE	DSE B2- Human nutrition and dietatics.	
SHILPA DUTTA (Lab demonstrator cum Curricular Instructor)	2ND SEM HONS/CC	CC4-Nervous system. Up to Muscle spindle.	CC3P and CC4P
	4TH SEM HONS/CC	CC9- Molecular Biology, CC8-Metabolism- amino acid to end.	
	6TH SEM HONS/CC	CC14- Skin and body temp.	
	6TH SEM HONS/DSE	DSE A4- Community and public health.	DSE A4 P
	2ND SEM GEN/CC	CC2- Cardiovascular system.	

TEACHING PLAN FOR JULY-DEC/ODD SEMESTER 2021

DEPARTMENT OF PHYSIOLOGY

DR KANAILAL BHATTACHARYYA COLLEGE

NAME OF TEACHER	CLASSES/COURSES	THEORY	PRACTICAL
MADHUMITA DEBNATH (FTT)	1ST SEM HONS/CC	Enzyme, Biochemistry (CHO and Lipid)	CC2P
	3rd SEM HONS/CC	Blood and body fluids	CC5P
	3rd SEM HONS/SEC	Hematology (SEC A)	
	5th SEM HONS/CC	Special senses (2nd part; olfaction and gustation)	CC11P & 12P
	5th SEM HONS/DSE	Biostatistics/ DSE A1	DSE A1/P
	5th SEM GEN/SEC	Microbiology & Immunology (SEC A1)	
DHRUBA SAUTYA (SACT)	1ST SEM HONS/CC	Cellular basis of physiology	
	3rd SEM HONS/CC	Respiratory system	
	5th SEM HONS/CC	Special senses (1st part; till Hearing)	
	5th SEM HONS/DSE	Work & sports Phy (DSE B1); till work organization	
	1st SEM GEN/CC	Cellular basis of physiology & Biophysics (till enzyme)	CC1P, Biochemistry
	3rd SEM GEN/CC	Special senses	CC3P, hum exp.
	5th SEM GEN/DSE	Hematology (DSE A2)	
ANANYA ADHIKARY (Visiting Faculty)	1ST SEM HONS/CC	Biophysical principles & Instrumentation	
	3rd SEM HONS/CC	Cardiovascular system (2nd part; VMC to end)	CC6P & CC7P
	5th SEM HONS/CC	Endocrinology (2nd part, adrenal cortex to end)	11P & 12P
	1st SEM GEN/CC	Digestion and Metabolism	
	3rd SEM GEN/CC	Nervous system	CC3P, Histology
	5th SEM GEN/DSE	------	DSE A2P, Hematology
SHILPA DUTTA (Visiting Faculty)	1ST SEM HONS/CC	Biochemistry (Protein and nucleic acid)	CC2P
	3rd SEM HONS/CC	Cardiovascular system (1st part; till the pulse)	
	3rd SEM HONS/SEC		
	5th SEM HONS/CC	Endocrinology (1st part, till parathyroid)	
	5th SEM HONS/DSE	Work & sports phys (DSE B1): 2ND PART TILL END.	DSE B1/P
	1st SEM GEN/CC	Biochemistry(CHO to nucleic acid)	CC1P, Hist & Titratn
	3rd SEM GEN/CC	Nerve muscle physiology	

Academic Session 2020-2021 (Geography Honours)

CBCS System

Semester 2(January-June)
CC-3 Human Geography

SEM-2 /CC-3		*Teacher*	*Class hour*	*Teaching Method*
• Nature and Scope and recent trends of human Geography • Approaches in Human Geography, resource and locational landscape • Concept and classification of race • Space, society and culture		KD KD KN KN	1 hr 1 hr 1 hr 1 hr	Lecture, ppt. demonstration, drawing
• **Unit-II-Society, Demography and Ekistics** • Evolution of human Societies, hunting and food gathering, pastoral nomads • Human adaptation to environment • Population growth and distribution • Population Resource Region • Development-environment conflict • Types and patterns of rural settlement • Rural house types • Morphology and hierarchy of urban settlement		SM KN KG SM SM KG	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing
Practical • Spatial Variation in Continent or country level religious composition by divided proportional circles • Measuring arithmetic growth rate • Types of age-sex pyramid • Nearest neighbour analysis		KD KN KG SM	1hr 1hr 1 hr 1 hr	Lecture and ppt, Drawing
			Total class hour	

Semester 2(January-June)
CC-4 Thematic Mapping and Surveying

SEM-2 /CC-4		***Teacher***	***Class hour***	***Teaching Method***
• Concept of Rounding, Logarithm, and anti logarithm • Concept of diagrammatic representation of data • Preparation and Interpretation of Geological maps • Preparation of weather maps • Preparation of land use and land cover maps		KD KD SM SM SM	1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing
• Preparation and Interpretation of Socio economic maps • Principal National Agencies producing thematic maps in India • Basic Concepts of Surveying: Prismatic Compass • Theodolite • Abney Level • Laser Distance Measurer		KN KG KG KD KD KD	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing
Practical • Traverse Surveying • Profile Survey using Dumpy Level • Height determination by Theodolite • Interpretation of geological maps		KG KN KD SM		Lecture and ppt, drawing
		Total class hour		

Semester 4(January-June)-2020-2021
CC-8-Economic geography

SEM-4/CC-8		*Teacher*	*Class*	*Teaching*

Unit-I Concepts			*hour*	*Method*
• Meaning and Approaches to Economic Geography • Concepts in Economic Geography • Concept of economic man • Economic distance and transport costs		KN KD KD KD	1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing
Unit II- Economic Activities • Concept and Classification of economic activities • Factors affecting location of economic activity • Primary Activities agriculture, forestry, fishing mining • Secondary activities-Classification of manufacturing regions • Tertiary activities-Transport trade and service • Transnational sea routes, railways and highways with reference to India • International trade and economic blocks • WTO and BRICs-Evolution, structure and functions		SM SM SM KG SM KD KD KG	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing
Practical • Choropleth Mapping • Proportional divided circles • Time series analysis • Detour Index		SM KN KG KD		Lecture and ppt, Drawing

		Total class hour		

Semester 4(January-June)
CC-9 Regional Planning

SEM-4/CC-9 ***Unit-I Regional Planning***		***Teacher***	***Class hour***	***Teaching Method***
• Regions-Concept, Types and delineation • Regional Planning, types, principles, objectives, tools and techniques • Regional planning and multi-level planning in India • Concept of metropolitan area and urban agglomeration		SM KG KG KD	1 hr 1 hr 1 hr 1 hr	Lecture and ppt, Drawing
Unit-II Regional Development • Concept of growth and development • Indicators of development • Human development • Theories and models of regional development: cumulative causation • Stages of development: Rostow, Growth Pole Model • Underdevelopment-Concept and Causes • Regional Development in India Disparity and Diversity • Need and measures of balanced development in India		KN KN SM SM kD SM KD KD	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing

Practical • Delineation of formal regions by weighted index method • Delineation of Functional regions by Breaking Point analysis • Measurement of inequality by Location Quotient • Measuring regional Disparity for Sopher Index		KN KD SM KD	1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing
		Total class hour		

Semester 4(January-June)
CC-10 Soil and Biogeography

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SEM-4/CC-10 ***Unit-I Soil Geography***		***Teacher***	***Class hour***	***Teaching Method***
• Factors of soil formation • Soil Properties-Texture, Structure and moisture • Significance of soil properties-pH, organic matter and NPK • Soil Profile and profile characteristics of laterite, podzol and Chernozem soil • Soil Erosion and degradation-factors,		SM KG KG KD	1 hr 1 hr 1 hr 1hr	Lecture and ppt, Drawing

process and management • Principles of soil classification-USDA and Genetic				
• **Unit-II Bio Geography** • Concepts of biosphere, biome, ecotone, community and ecology • Concept of trophic structure, food chain, food web and energy flow • Classification of World biomes • Bio geochemical Cycles • Deforestation • Biodiversity		KN KN SM SM kD SM KD KD	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing
• **Practical** • Determination of soil reaction-pH and Salinity • Determination of soil type by ternary diagram • Plant diversity determination Matrix method • Time Series analysis of biogeography data		SM KN KD KD	1 hr 1 hr 1hr 1hr	Lecture and ppt, Drawing

Total class hour	

Semester-6-2020-2021

CC-13-Evolution of Geographical Thought

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SEM-6/CC-13 ***Unit-I Nature of pre–Modern Geography***		***Teacher***	***Class hour***	***Teaching Method***
• Development of pre-modern Geography Contribution of Greek, Chinese and Indian Geographers • Impact of Dark age in Geography • Geography during the age of Discovery and Exploration • Transition from Cosmography to scientific Geography		SM KG KD SM	1 hr 1 hr 1 hr 1hr	Lecture and ppt, Drawing
• **Unit-II Foundations of modern Geography** • Evolution of Geographical thought • Contributions of Humboldt and ritter • Contributions of Richthofen, Hartshorne, Ratzel and La Blache • Trends of Geography in the post-World War-II Quantitative revolution and system approach • Structuralism and materialism • Changing concept of Space		KN KN SM SM kD SM KD	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing

• Evolution of critical Geography • Towards the post modernism Geography in the 21st century		KD	1 hr 1 hr	
Practical • Changing Perception of maps of the world • Mapping Voyages • Group presentation of 5 to 10 students		KD KN SM	1 hr 1 hr 1hr	lecture ppt and drawing
		Total class hour		

Semester 6/CC-14-2020-21

Hazard Management

Semester-6-2020-2021

CC-14

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SEM-6/CC-14 ***Unit-I concept***		***Teacher***	***Class hour***	***Teaching Method***
• Classification of hazard and disaster • Approaches to hazard study • Responses to hazards • Hazard mapping		KG SM KG	1 hr 1 hr 1 hr	Lecture and ppt, Drawing

		KD	1hr	
• **Unit-II Hazard Specific Study** • Earthquake Factors, Vulnerability and management • Landslide factors, vulnerability and management • Flood factors, Vulnerability and management • Riverbank erosion, factors and management • Fire factors: Factors, vulnerability and management • Biohazard-Classification, Vulnerability and management • Tropical Cyclone Factors, Vulnerability and management		KN KD SM SM KD KG SM	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing
Practical A group project report is to be prepared and submitted based on any one case study Earthquake Landslide Thunderstorm Flood Riverbank/ Coastal Erosion Fire Industrial Accident Road accident		KD and KN		lecture

Structural Collapse				

Environmental Pollution Biohazard				
		Total class hour		

Semester 6 DSE-A5-2020-21

Fluvial Geomorphology

SEM-6/DSE-A5		***Teacher***	***Class hour***	***Teaching Method***
• Scope and Components of fluvial Geomorphology • Processes and significance of sediment entrainment • Models of channel Initiation • Linear, Areal and altitudinal properties • Fundamentals of Rosgen Stream Classification • Fluvial morpho dynamics • Large rivers of tropics • Fluvial Landforms		KD	1 hr for each class	Lecture and ppt, drawing
• Riverbank Erosion and river degeneration • Human Intervention on fluvial Systems • Concept and Significance of Ecological Flow • Integrated watershed management		SM	1 hr For each class	Lecture and ppt, drawing

• **Practical** • Identification of drainage pattern from Topographical maps • Riverbank erosion -Quantification of		SM	1 hr	Lecture and ppt, drawing

eroded area and Vulnerability Zonation • Flood Frequency analysis • Analyses of pebbles		KD SM KD	1 hr 1 hr 1 hr	Lecture and ppt, drawing
		Total class hour		

Semester 6 Honours- DSE-A6

Environmental Issues in Geography-2020-21

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SEM-6/DSE-A6		***Teacher***	***Class hour***	***Teaching Method***

• Geographer's approach to environmental studies • Concept of holistic environment and system approach • Ecosystem and their relation with habitats: habitat loss in West Bengal • Wetland ecosystem with special reference to East Kolkata Wetlands • Wetland Ecosystem with special reference to East Kolkata Wetlands • Rural Environmental issues: Special reference to sanitation and public health • Urban environmental issues with special reference to waste management • Environmental impact assessment and		KN KN KG KG KG SM SM	1 hr 1 hr 1 hr 1hr 1hr 1hr	Lecture and ppt, drawing Lecture and ppt,
environmental Management Planning • Overview of principal environment related regulations • Principles of watershed management • Principles of forest management		SM KD KN KG	1 hr 1 hr 1 hr 1 hr	drawing Lecture and ppt, drawing

Practical • Preparation of questionnaire for perception survey • Preparation of check list for environmental Impact assessment • Quality assessment of soil using field kit • Interpretation of changes in air quality using multi seasonal and multi-city CPCB data		SM SM KD KD	1 hr 1 hr 1 hr 1 hr	Lecture and ppt, drawing Lecture and ppt, drawing

		Total class hour		

Academic Session-2021-22-July to December

Under CBCS System

Semester 1(July-December)

CC – 1

CC-1(Theory)	***Teacher***	***Class Hour***		***Teaching Method***

UNIT:-1-Geotectonic • Earth's tectonic and structural evolution • Earth's interior with special reference to seismology, isostacy, models of Airy, Pratt • Plate tectonics as unified theory of global tectonics • Folds and Faults	*KN* *KN* *KG* *SM*	1 hr 1 hr 1 hr		Lecture. Drawing and demonstration Lecture. Drawing and demonstration
UNIT- II= Geomorphology • Degradational Process Weathering, Mass wasting and landforms • Process of entrainment, transportation, and deposition by different geomorphic agents • Development of River network and landforms on uniclinal and folded structure • Development of river network, and landforms on granite, basalt and limestones	KG KD SM KD SM	1 hr 1 hr 1 hr 1 hr		Lecture, PPT presentation Lecture. Drawing and demonstration Lecture. Drawing and demonstration

• Coastal process and landforms • Glacial and Glacio-fluvial Process • Aeolian and fluvio-aeolian process and landforms • Role of time in Geomorphology, Schumm and Litchy's Model, Views of Davis, Penck, King and Hack	KG KN SM & KD	1 hr 1 hr 1 hr 1 hr		Lecture. Drawing and demonstration
• **Practical -CC1** • Measurement of dip and strike using Clinometer • Identification of minerals and rock samples • Construction of hypsometric curves of a drainage basin • Extraction and interpretation of geomorphic information from survey of India 1:50 K topographical map	KD KN KG SM	1 hr 1 hr 1 hr 1 hr		Lecture. Drawing and demonstration Lecture. Drawing and demonstration
		Total class hour		

CC – 2/ Semester 1-2021-22
Cartographic Techniques

CC-2(Theory)	***Teacher***	***Class Hour***	***Teaching Method***	
•Maps, Components and Classification • Concept and	KG KN	1 hr	Lecture, ppt, Drawing	

Application of Scales • Coordinate Systems • Grids, angular and linear system • Bearing- Magnetic and true, whole circle and reduced • Concept of Geoid and spheroid • Representation of using dots sphere and proportional circles • Representation of data using isopleths, choropleths and chorochromatic maps • Survey of India Topographical Maps Reference Scheme of old and open series	SM KD KD SM SM SM	1 hr 1 hr 1 hr 1hr 1 hr 1 hr 1 hr	Lecture, ppt, Drawing	
CC2 Practical • Graphical Construction of Scales, Plain, Diagonal and Vernier	KN	1 hr	Lecture, ppt, Drawing	Lecture, ppt, Drawing
• Construction of Projection: Polar Zenithal, Simple Conic with one standard Parallel, Bonne's , Cylindrical Equal area, Mercator's	KD KN KG	1 hr 1 hr 1 hr	Lecture, ppt, Drawing	
• Thematic Maps: Proportional Squares, Pie Diagrams, Proportional Circles, Dots and Spheres	KN KD KG	1hr i hr 1 hr	Lecture, ppt, Drawing	and handouts
• Choropleth, Isopleth, Chorochromatic maps	SM	1 hr	Lecture, ppt, Drawing	and handouts

Total class hour			

Semester-3 hons.(July to December)-2021-2022

CC – 5

Climatology

CC-5(Theory) Climatology	***Teacher***	***Class Hour***		***Teaching Method***
• Nature and Composition and layering of Atmosphere • Insolation, Controlling Factors, Heat Budget	KN	1 hr 1 hr		Demonstration in class with diagrams and handouts
• Horizontal and vertical distribution of temperature, • Inversion of temperature	KD	1 hr 1 hr		Demonstration in class with diagrams and handouts
• Overview of Climatic Change, Greenhouse Effect, Formation, Depletion and Significance	SM	1 hr		Demonstration in class with diagrams and handouts

Unit-II Atmospheric Phenomena and Climatic Classification • Condensation, process and forms, forms of precipitation • Air Mass: Typology, origin and characteristics • Fronts: Warm and Cold , Frontogenesis and Frontolysis • Weather: Stability and Instability, barotropic and baroclinic conditions • Circulation in the atmosphere, planetary winds, jet streams • Atmospheric Disturbances-Cyclones and thunderstorms	KN KD KG KD KG SM	1 hr 1hr 1 hr 1 hr 1 hr 1 hr		Demonstration in class with diagrams and handouts

• Monsoon Circulation and mechanism in India • Climatic Classification-Thornthwaite and Oliver **Practical** • Measurement and weather elements using analogue instruments • Interpretation of weather map • Construction of Hythergraph and Climograph • Construction of Wind Rose	SM KD SM+ KD SM KD & KG KN	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	4	Demonstration in class with diagrams and handouts
		Total class hour		

CC – 6 (Semester 3)
Hydrology and Oceanography

CC-6- ***Unit-I Hydrology***		***Teacher***	***Class Hour/ Domain***	***Teaching Method***
• System approach in hydrology, Global Hydrological cycle		KN	1 hr	Lecture, drawing and ppt
• Run-Off, Controlling Factors		KN	1 hr	
• Drainage basin, principles of water harvesting and watershed management		KD	1 hr	
• Groundwater occurrence and storage		KD	1 hr	
Unit-II Oceanography		KG	1 hr	lecture and drawing
• Major relief features of the ocean		KG	1 hr	
floor • Physical and chemical properties		KD	1 hr	
• Water mass, T-S diagram		KG	1 hr	
• Air sea interactions, ocean circulation, wave and tide		SM	1 hr	
• Ocean temperature and Salinity		SM	1 hr	
• Coral reefs-formation and		SM	1 hr	
classification • Marine resources		KD	1 hr	
• Sea level change, types and causes				

Semester-3
2021-22
SEC – A3-01- Theory
Coastal Management

SEC-A3		***Teacher***	***Class hour***	***Teaching Method***
• Components of coastal Zones-Coastal morpho dynamic variables		KD	1 hr	Lecture, PPt

• Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism		KD	1 hr	Lecture, PPt
• Coastal hazards and their management		KD	1 hr	Lecture, PPt
• Principles of Coastal Zone Management Exclusive Economic Zone and Coastal Regulation Zones		KD	1 hr	Lecture, PPt
		Total class hour		

Semester-5 hons(July to December)

2021-22

CC-11

CC-11 Research Methodology		***Teacher***	***Class Hour/ Domain***	***Teaching Method***
• Research In Geography • literature Review • Defining research problem • Research materials and methods • Techniques of writing reports • Plagiarism		KD KD KN KN	1 hr 1 hr 1 hr 1 hr	Lecture, PPt
• Fieldwork in Geographical Studies • Field techniques and tools • Positioning and collection of samples • Post field tabulation • Fieldwork-Logistic and handling of emergencies		SM KN KG KD SM		Lecture, PPt

Practical Field report and Lab bk		KN KD KG SM	1 hr 1 hr 1 hr 1 hr	Lecture, PPt
		Total class hour		

Sem-5/CC-12-2021-22

Remote Sensing And GIS

CC-12		***Teacher***	***Class Hour/ Domain***	***Teaching Method***
• Principles of remote sensing • Sensor resolutions and their applications • Image referencing scheme • Preparation of false colour composite • Principles of image interpretation • Acquisition and utilisation of free Digital elevation		KD KD KN KN	1 hr 1 hr 1 hr 1 hr	Lecture, PPt
• GIS data structure type • Principles of preparing attribute tables • Principle of buffer preparation • Principles of overlay analysis • GNSS • Transferring GNSS to GIS		SM KN KG KD SM		Lecture, PPt
Practical				Lecture, PPt

• Image georeferencing and enhancement • Supervised image classification • Digitisation of features • Waypoint collection from GNSS		KD	1 hr 1 hr 1 hr 1 hr	

TEACHING PLAN (Geography General)

Academic Session 2018-2019

Under CBCS System

Semester 1(July-December)

CC/GE – 1

Physical Geography

CC/GE-1 ***Unit I-Geotectonics***		***Teacher***	***Class hour***	***Teaching Method***
• Earth's interior with special reference to seismology • Plate tectonics • Folds and faults		KN KG SM	1 hr 1 hr 1 hr	Lecture, PPt
Unit-II Geomorphology • Degradational process-Weathering, Mass Wasting and Resultant Landforms • Principal geomorphic agents classification, and evolution of fluvial, coastal, aeolian and glacial landforms • Basic models of slope evolution, decline, replacement and retreat		KG SM KD	1 hr 1 hr 1 hr	Lecture, PPt

• **Unit-III Hydrology** • Global Hydrological Cycle • Run Off: Controlling Factors, Concept of Ecological Flow		KN	1 hr 1 hr	Lecture, PPt

• Drainage basin as hydrological Unit		KD	1 hr	
Unit IV- Oceanography • Physical and Chemical Properties of Ocean Water: Distribution and Determination of temperature and Salinity • Ocean Circulation • Marine Resources • **Practical** • Identification of Rocks and minerals • Extraction of physiographic information from Survey of India topographical map • Extraction of drainage information from Survey of India Topographical Map		KD KN SM KN SM KG+KD	1 hr 1 hr 1 hr 1 hr 1 hr 1 hr	Lecture, PPt

				Lecture, PPt
		Total class hour		

Semester -3-2018-19
GE-3

CC/GE-3 ***Unit-I- Economic Geography***		***Teacher***	***Class hour***	***Teaching Method***
• Sectors of Economy		• SM	1 hr	Lecture, PPt
• Location of economic activities: Theories of Von Thunen, Losch,		SM	1 hr	
Weber • Location of industries: Cotton, Iron and Steel		KG	1 hr	
• Globalisation and integration of world economies		KD	1 hr	

TEACHING PLAN OF POLSCIENCE

JANUARY-MAY-2020

SEMESTER-2

Comparative Government and Politics Code: PLS-G-CC-2-2-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1.	1 Political System	1. Liberal-democratic, 2.Authoritarian . 3.Socialist – 4forms of Political Systems: Unitary and Federal,	1 1 1 5	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

		Parliamentary and Presidential.			
2	UK	(a)Basic features with major focus on Conventions and rule of Law. (b)Legislature: composition and functions with major focus on the concept of parliamentary sovereignty. IExecutive:composition and functions of the Cabinet with major focus on the role of the Prime Minister – the concept of Cabinet Dictatorship; (d) Role of the Crown; I Party system – role of the Opposition	4 3 4 2 2	Anasua Chatterjee	Use of online teaching in GOOGLE CLASSROOM
3	.U.S.A.:	(a) Basic features (b) US federalism I Bill of rights (d)Legislature: composition and functions with major focus on the Presiding Officers and Committee System; IThe Executive: The President: election, powers and functions. US Cabinet: composition and functions; (f)Supreme Court: composition and functions; (g) Party system.	2 2 1 6 6 3 2	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
	MODULE-II				
4	PRC (1982 Constitution.	(a) Significance of the Revolution (b) Basic features withspecial reference to General Principles	2 3	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM

		I Communist Party: structure, functions, role (d) Rights and Duties of Citizen ITheNationalGovernment: i) The Executive: President, Premier, State Council, ii) The Legislature: National People' Congress ,Standing Committee iii) The Judiciary.	3 2 4 4 3		
5	Salient features of Constitution of France,Switzerland. ,Russia		6	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SEMESTER-IV

JANUARY-MAY-2020

International Relations Code: PLS-G-CC-4-4-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	International Relations as a field of study. Approaches:	(a) Classical Realism (Hans Morgenthau) and Neo-Realism (Kenneth Waltz) (b)Neo-Liberalism: Complex Interdependence (Robert O. Keohane and Joseph Nye) (c) Structural Approaches: World Systems Approach (Immanuel Wallerstein) and Dependency School (Andre Gunder Frank) (d) Feminist Perspective (J. Ann Tickner)	3 4 6 3	Ellora Bhattacharyya	Lecturing and class room discussion, online teaching through google classroom
2	Cold War	(a) Second World War & Origins of Cold War;	2 2 3	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

		(b) Phases of Cold War: First Cold War; (c)Rise and Fall of Detente Second Cold War.			
	MODULE-II				
3	End of Cold War:	(a)Collapse of the Soviet Union (b)Post Cold- War Era and (c)Emerging Centers of Power (European Union, China, Russia and Japan)	2 2 6	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
4	India's Foreign Policy	(a) Basic Determinants (Historical, Geo-Political, Economic, Domestic and Strategic); (b) India's Policy of Non-Alignment; (c) India as emerging Power	4 3 3	Sk Saddam Hossen	Lecturing and classroom discussion. Use of lecture series available on the internet, govt sources etc Use of online teaching in GOOGLE CLASSROOM

SEC- Basic Research Methods Code: PLS-G-SEC-6-B(2)-TH

MODULE 1

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Case study.		2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
2	Survey Approach:	1.Interviewing- different types and forms, 2.qualities of a good interviewer; 3.Preparingquestionnaire, types of questionnaire. 4.Pilot Survey	2 1 2 1	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
3	Focus Groups:	role of researcher; uses and abuses.	2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Experimental research: types.	Aggregate Data analysis: sources, utility and limitations.	4	Sk Saddam Hossen	Lecturing and class room discussion and demonstrations of graphs etc Google classroom and google meet
2	Content Analysis:	major issues.	2	Sk Saddam Hossen	Lecturing and class room discussion Google classroom and google meet
3	Participant observation:	Modes, advantages and disadvantages.	3	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM

ACADEMIC SESSION 2020-2021

SEMESTER-1

JULY-DECEMBER-2020

Introduction to Political Theory. Code: PLS-G-CC-1-1-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Political Science:	nature and scope; Different approaches--- Normative, Behavioural, Post-Behavioural, Marxist, Feminist	10	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
2	(a) State:. (b) Sovereignty of the State:	1.Contract theory; 2.Idealist theory; 3.Liberal theory; 4.Marxist theory; 5.Gandhian theory. 1. Monistic and Pluralist theories. 2Doctrine of Popular Sovereignty.	2 2 2 2 2 4 2	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM

3	Foundational concepts:	1.Law: Concept and nature. 2.Right: types and theories of rights 3Liberty : Meaning, sources 4.Equality— meanings, sources, interrelationships .	2 3 2 2	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
4	Key concepts	1.Nationalism and Internationalism —meanings and features; 2.Democracy--- meaning and nature.	4 3	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
5	Marxism	1.Dialectical and Historical Materialism; 2.Class and Class Struggle; 3. Theory of Revolution; 4 Lenin's Theory of Imperialism.	4 2 1 2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
6	Fascism:	Meaning, features and significance	4	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
7	1.Political parties and interest groups 2.Methods of representation:	functions and role; territorial, functional, proportional.	4 2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SEMESTER-3

JULY-DECEMBER-2020

Government and Politics in India Code: PLS-G-CC-3-3-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Evolution of the Constitution (brief).	1.The Preamble; 2.Fundamental Rights. 3.Directive Principles;	2 6 3	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM

2	Union-State Relations – nature of federalism.		6	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
3	Union Executive:	President, Vice-President, Prime Minister, Council of Ministers.	8	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
4	Union Legislature:	Lok Sabha and Rajya Sabha---organisation, functions, law Making procedure, Privileges, Committee System, Speaker.	10	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
5	Constitutional amendment procedure.		3	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
MODULE-II					
6	Government in States:	1.Governor; 2. Council of Ministers and the Chief Minister; 3.State Legislature: composition and functions.	2 2 2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
7	Local Government:	rural and urban. Significance of 73rd and 74th Amendments.	5	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
8	Election Commission and election reforms.		5	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
9	Party System in India:	1.National political parties: Ideologies and programmes. 2.Recent trends in India: rise of regional political parties; coalition politics.	5 5	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM
10	Regionalism:	Nature, roots, types.	4	Anasua Chatterjee	Lecturing and

					Use of online teaching in GOOGLE CLASSROOM
11	Varieties of social and political movements:	a) caste; tribe; b) religion; c)environment; d) women's movements	2 2 3 2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SEC- Legal Literacy Code: PLS-G-SEC-3 and 5-A (1)-TH

MODULE-1

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Legal Issues of Criminal Jurisdiction:	1.History, Definition and Concept, 2. Major Processes— Detention, Arrest, Bail, Search and Seizure.	2 6	Anasua Chatterjee	Lecturing and classroom discussion, Use of Bare Acts and also Govt archival literature. Use of online teaching in GOOGLE CLASSROOM
2	Indian Penal Code:	1.History, Definition. Major Aspects— 2.Protection of Primary and Secondary Personal Rights, 3.Criminal Conspiracy, Offences against the State, 4.Offences related to Marriage.	2 2 3 2	Anasua Chatterjee	Lecturing and classroom discussion, Use of Bare Acts and also Govt archival literature. Use of online teaching in GOOGLE CLASSROOM
3.	Personal Laws:	Laws related to Marriage (examples from Hindu, Islam and Christian Laws).	6	Anasua Chatterjee	Lecturing and classroom discussion, Use of Bare Acts and also Govt archival literature. Use of online teaching in GOOGLE CLASSROOM

MODULE-2

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Consumer Rights Laws:	1.Definition of Consumer Rights, 2.Process of filing a complaint. 3.Right to Information Act: provisions; importance.	2 2 3	Sk Saddam Hossen	Lecturing and classroom discussion. Use of various websites and lecture series available on the internet Use of online teaching in GOOGLE CLASSROOM
2	Anti-Terror Laws:	1.Meaning, Terrorist and Disruptive Activities (Prevention) (TADA) Act 1987, 2002 and 2.Prevention of Terrorism (POTA) Act 2002.	6 4	Sk Saddam Hossen	Lecturing and classroom discussion. Use of various websites and lecture series available on the internet Use of online teaching in GOOGLE CLASSROOM
3	Human Rights Laws:	1.Meanings, Universal Declaration of Human Rights (UDHR), 2.Human Rights Act of 1993, Issues of rights of Children and Women.	5 5	Sk Saddam Hossen	Lecturing and classroom discussion. Use of various websites and lecture series available on the internet Use of online teaching in GOOGLE CLASSROOM

SEMESTER-5

JULY-DECEMBER-2020

DISCIPLINE SPECIFIC ELECTIVE

Public Administration Code: PLS-G-DSE-A-5-1A-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Nature and Scope of Public Administration.		4	Sk Saddam Hossen	Lecturing and class room discussion, online teaching through

					google classroom
2	Key Concepts:	1.Hierarchy; 2.Unity of Command; 3.Span of Control; 4.Authority; 5.Centralization and Decentralization; 6.Line and Staff; 7.Communication and Control; 8.Delegation; 9.Decision-making; 10.Coordination and Leadership.	1 1 1 1 2 2 1 1 1 2	Sk Saddam Hossen	Lecturing and class room discussion, online teaching through google classroom
3	Major Approaches:	1.NewPublicAdministration; 2.Comparative Public Administration; 3.DevelopmentAdministration; 4.New Public Management.	2 4 2 2	Anasua Chatterjee	Lecturing and class room discussion, online teaching through google classroom

MODULE-2

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Bureaucracy: Views of Weber and Marx		6	Ellora Bhattacharyya	Lecturing and class room discussion, online teaching through google classroom
2	Public Policy: Formulation and Implementation.		4	Ellora Bhattacharyya	Lecturing and classroom discussion. Use Of lecture series available on the internet, govt sources etc through Google classroom
3	Major Programmes (basic features and objectives	1.MGNREGA; 2.Sarva Shiksha Abhiyan; 3.National Rural Health Mission.	2 2 2	Anasua Chatterjee	Lecturing and classroom discussion. Use of lecture series available on the internet, govt sources etc Google Classroom and Google Meet

JANUARY-MAY-2021

SEMESTER-2

Comparative Government and Politics Code: PLS-G-CC-2-2-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1.	1 Political System	1.Liberal-democratic, 2.Authoritarian . 3.Socialist – 4forms of Political Systems: Unitary and Federal, Parliamentary and Presidential.	1 1 1 5	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
2	UK	(a)Basic features with major focus on Conventions and rule of Law. (b)Legislature: composition and functions with major focus on the concept of parliamentary sovereignty. IExecutive:composition and functions of the Cabinet with major focus on the role of the Prime Minister – the concept of Cabinet Dictatorship; (d) Role of the Crown; I Party system – role of the Opposition	4 3 4 2 2	Anasua Chatterjee	Use of online teaching in GOOGLE CLASSROOM
3	.U.S.A.:	(a) Basic features (b) US federalism I Bill of rights (d)Legislature: composition and functions with major focus on the Presiding Officers and Committee System; IThe Executive: The President: election, powers	2 2 1 6 6 3	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM

		and functions. US Cabinet: composition and functions; (f)Supreme Court: composition and functions; (g) Party system.	2		
	MODULE-II				
4	PRC (1982 Constitution.	(a) Significance of the Revolution (b) Basic features with special reference to General Principles I Communist Party: structure, functions, role (d) Rights and Duties of Citizen ITheNationalGovernment: i) The Executive: President, Premier, State Council, ii) The Legislature: National People' Congress ,Standing Committee iii) The Judiciary.	2 3 3 2 4 4 3	Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
5	Salient features of Constitution of France,Switzerland. ,Russia		6	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SEMESTER-IV

JANUARY-MAY-2021

International Relations Code: PLS-G-CC-4-4-TH+TU

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	International Relations as a field of study. Approaches:	(a) Classical Realism (Hans Morgenthau) and Neo-Realism (Kenneth Waltz) (b)Neo-Liberalism: Complex Interdependence	3 4	Ellora Bhattacharyya	Lecturing and class room discussion, online teaching through google classroom

		(Robert O. Keohane and Joseph Nye) (c) Structural Approaches: World Systems Approach (Immanuel Wallerstein) and Dependency School (Andre Gunder Frank) (d) Feminist Perspective (J. Ann Tickner)	6 3		
2	Cold War	(a) Second World War & Origins of Cold War; (b) Phases of Cold War: First Cold War; (c)Rise and Fall of Detente Second Cold War.	2 2 3	Pallabi Basu(visiting Faculty)	Lecturing and Use of online teaching in GOOGLE CLASSROOM
	MODULE-II				
3	End of Cold War:	(a)Collapse of the Soviet Union (b)Post Cold- War Era and (c)Emerging Centers of Power (European Union, China, Russia and Japan)	2 2 6	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
4	India's Foreign Policy	(a) Basic Determinants (Historical, Geo-Political, Economic, Domestic and Strategic); (b) India's Policy of Non-Alignment; (c) India as emerging Power	4 3 3	Sk Saddam Hossen	Lecturing and classroom discussion. Use of lecture series available on the internet, govt sources etc Use of online teaching in GOOGLE CLASSROOM

SEC- Basic Research Methods Code: PLS-G-SEC 4 and -6-B(2)-TH

MODULE 1

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Case study.		2	Anasua Chatterjee	Lecturing and Use of online teaching in

					GOOGLE CLASSROOM
2	Survey Approach:	1.Interviewing- different types and forms, 2.qualities of a good interviewer; 3.Preparingquestionnaire, types of questionnaire. 4.Pilot Survey	2 1 2 1	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
3	Focus Groups:	role of researcher; uses and abuses.	2	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	Experimental research: types.	Aggregate Data analysis: sources, utility and limitations.	4	Sk Saddam Hossen	Lecturing and class room discussion and demonstrations of graphs etc Google classroom and google meet
2	Content Analysis:	major issues.	2	Sk Saddam Hossen	Lecturing and class room discussion Google classroom and google meet
3	Participant observation:	Modes, advantages and disadvantages.	3	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM

DISCIPLINE SPECIFIC ELECTIVE

Human Rights: Theory and Indian Context Code: PLS-G-DSE-B-6-2B-TH+TU

MODULE-I

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	1. History of the idea of human rights; Evolution of generations of human rights.		3	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM

2	2. Universal Declaration of Human Rights: provisions and significance		4	Anasua Chatterjee	Lecturing and Use of online teaching in GOOGLE CLASSROOM
3	3. UN and human rights: charters; UN Human Rights Commission; Vienna Declaration and Programme of Action.		2 1 2 2	Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM

MODULE-II

SL NO	TOPIC	SUB-TOPIC	NO OF CLASSES	NAME OF TEACHER	TEACHING METHOD
1	4. Indian Constitution and the foundation of rights.			Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
2	5. National and State Human Rights Commissions: structure and functions.			Ellora Bhattacharyya	Lecturing and Use of online teaching in GOOGLE CLASSROOM
3	6. Human rights in India: problems and remedies.			Sk Saddam Hossen	Lecturing and Use of online teaching in GOOGLE CLASSROOM

Teaching Plan
Department of Food & Nutrition (General)
Under CBCS System ; Calcutta University

Syllabus Distribution (July-Dec/Odd Semester 2020)

Module ; CC – 1AT
INTRODUCTION TO ELEMENTARY CHEMISTRY

Name of the Teacher	*Semester*	*Class Hour (Th+ Prac)*	*Theory*	*Practical*
Mousumi Das (Sact)	*1st*	*6*	*1. Law of conservation of mass,* ✓ *Physical &chemical changes,* ✓ *Mechanical mixtures*	
Mousumi Das (Sact)	*1st*	*2+2*	*2. Common laboratory process*	*Sedimentation, Decantation, Filtration, distillation, Solution, crystallization, separation of constituents of mixture*
Mousumi Das (Sact)	*1st*	*4+2*	*3. Naming of compound* ✓ *(symbols , valency, formula, equation)* ✓ *Acids , bases and salt*	*Titration of acid & bases*

Mousumi Das **(Sact)**	***1st***	***4+2***	***4. Classification of salt,*** ✓ ***buffer solution,*** ✓ ***acid-base ,acid-base indicator,*** ✓ ***Molar,normal ,formula solution***	***Titration of acid & bases***
Mousumi Das **(Sact)**	***1st***	***2+4***	***5. Diffusion and osmosis*** ***6. Colloids***	***Qualitative tests:*** ➢ ***Protein in milk and egg*** ➢ ***Calcium***
Mousumi Das **(Sact)**	***1st***	***6+1***	***7. Structure of atomic molecule***	***Qualitative tests:*** ➢ ***Phosphorus & iron in foodstuff***
Mousumi Das **(Sact)**	***1st***	***6+5***	***8. Organic chemistry*** ***(chemistry of carbon compounds)***	***Simple chemical tests for carbohyrate***
Total class hour			***TH-30 hours***	***PRAC-16 hours***

CBCS System
Syllabus Distribution

(Jan-June/Even Semester 2021)

Module ;CC – 1BT

INTRODUCTION TO ELEMENTARY PHYSICS

Name Of The Teacher	*Semester*	*Class Hour (Th+ Prac)*	*Theory*	*Practical*
Mousumi Das. (Sact)	*2nd*	*2+1*	*1. Units-* *C.G.S. AND F.P.S. system* *2. Measurement* *Of mass & weight,* *common & spring balance*	*Use of balance*
Mousumi Das. (Sact)	*2nd*	*2+4*	*3. Motion of body- Displacement, Velocity, acceleration*	*Determination of specific gravity of a liquid by specific gravity bottles*
Mousumi Das. (Sact)	*2nd*	*2+4*	*4. Gravity-* *Acceleration due to gravity*	*Determination of specific gravity of a solid*
Mousumi Das. (Sact)	*2nd*	*3+4*	*5. Hydrostatics –* *Pressure at a point,* *Archimedes principle*	*Determination of specific gravity of a liquid by hydrostatic pressure*

			Specific gravity, Viscosity & Surface tension	
Mousumi Das. (Sact)	***2nd***	***2+2***	***6. Thermometry*** ***7. Calorimetry***	***Reading of barometer + determination of lower and upper fixed point of a thermometer***
Mousumi Das. (Sact)	***2nd***	***2***	***8. Transmission of heat, Thermoflask***	
Mousumi Das. (Sact)	***2nd***	***3***	***9. Matter ,Changes of state, Pressure cooker ,Ice machine***	
Mousumi Das. (Sact)	***2nd***	***2***	***10. Static electricity-*** ***11. Primary cell, storage cell***	
Mousumi Das. (Sact)	***2nd***	***1***	***12. Electroplating***	
Mousumi Das. (Sact)	***2nd***	***2***	***13. Definition of potential, Current-Relation between two***	

Mousumi Das. *(Sact)*	*2nd*	*2+1*	*14. Electricity & its application*	*Fitting of a electric fuse*
Mousumi Das. *(Sact)*	*2nd*	*2*	*15. Refrigerator ,* *Cold storage ,* *Electric fuse*	
Total class hour			*Th -25 hours*	*Prac- 16 hours*

CBCS System

SYLLABUS DISTRIBUTION (JULY-DEC/ODD SEMESTER 2021)

MODULE ;CC – 1CT

INTRODUCTION TO ELEMENTARY PHYSIOLOGY

Name of The Teacher	*Semester*	*Class Hour (Th + Prac)*	*Theory*	*Practical*
Mousumi Das. (Sact)	*3rd*	*1 +1*	*1. Animal cell:* *Structure & function*	Demonstration for determination of blood pressure of human being

Mousumi Das. (Sact)	***3rd***	***2+2***	***2. Tissue:*** ***Structure, Function,*** ***Types***	***Identification of slides*** *(blood cells,Stomch,Small intestine,Large intestine,Liver,Pancreas)*
Mousumi Das. (Sact)	***3rd***	***6 + 2***	***3. Digestive system (structure & function)*** ***4. Digestion of carbohydrate, Protein & fat*** ***5. Absorption***	Determination of bleeding time and clotting time
Mousumi Das. (Sact)	***3rd***	***10 +2***	***6. Elementary idea of metabolism*** ***7. Enzymes and their hormones*** ***8. Metabolism in brief*** ***9. Role of hormones in carbohydrate metabolism***	*Detection of blood group*
		Total class hour	***Theory-17 hour***	***Prac-7 hour***

CBCS System
SYLLABUS DISTRIBUTION
(JULY-DEC/ODD SEMESTER 2021)
MODULE ; SEC – 1CP
INTRODUCTION TO FOOD PRESERVATION
(skill enhancement course)

Name of the teacher	*Semester*	*Class Hour*	*Theory*
Mousumi Das. (Sact)	***3rd***	***10***	***1. Elementary idea of Food Preservation*** ***2. Principle and different methods (in brief)***
Mousumi Das. (Sact)	***3rd***	***6***	***3. Preparation & packaging of jam , jelly, chili sauce***
Mousumi Das . (Sact)	***3rd***	***6***	***4. Preparation & packaging of tomato ketchup,squash,pickles etc.***
		Total	***22***

Teaching Plan
Department of Food & Nutrition (General)
Under CBCS System ; Calcutta University

Syllabus Distribution (July-Dec/Odd Semester 2021)

Module ; CC – 1AT
INTRODUCTION TO ELEMENTARY CHEMISTRY

Name of the Teacher	*Semester*	*Class Hour (Th+ Prac)*	*Theory*	*Practical*
Mousumi Das (Sact)	*1st*	*4*	*9. Law of conservation of mass,* ✓ *Physical &chemical changes,* ✓ *Mechanical mixtures*	
Mousumi Das (Sact) + Riya Bag (Guest Lecturer)	*1st*	*1+2*	*10. Common laboratory process*	*Sedimentation, Decantation, Filtration, distillation, Solution, crystallization, separation of constituents of mixture*
Riya Bag (Guest Lecturer)	*1st*	*2+2*	*11. Naming of compound* ✓ *(symbols , valency, formula, equation)* ✓ *Acids , bases and salt*	*Titration of acid & bases*

Riya Bag **(Guest Lecturer)**	***1st***	***3+2***	***12. Classification of salt,*** ✓ ***buffer solution,*** ✓ ***acid-base ,acid-base indicator,*** ✓ ***Molar,normal ,formula solution***	***Titration of acid & bases***
Mousumi Das **(Sact)** **+** **Riya Bag** **(Guest Lecturer)**	***1st***	***2+4***	***13. Diffusion and osmosis*** ***14. Colloids***	***Qualitative tests:*** ➢ ***Protein in milk and egg*** ➢ ***Calcium***
Riya Bag **(Guest Lecturer)**	***1st***	***4+1***	***15. Structure of atomic molecule***	***Qualitative tests:*** ➢ ***Phosphorus & iron in foodstuff***
Riya Bag **(Guest Lecturer)**	***1st***	***6+5***	***16. Organic chemistry*** ***(chemistry of carbon compounds)***	***Simple chemical tests for carbohyrate***
Total class hour			***TH-22 hours***	***PRAC-16 hours***

TEACHING PLAN
(ZOOLOGY)
Academic Session 2020-2021
Under CBCS System
Semester 1(July-December)
CC – 1
CORE COURSE 1. Non-Chordates I

ZOOA-CC1-1-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Basics of Animal Classification	SP	4	Theoretical
Unit 2: Protista and Metazoa	SB	15	Theoretical
Unit 3: Porifera	GH	6	Theoretical
Unit 4: Cnidaria	GH	10	Theoretical
Unit 5: Ctenophora	GH	2	Theoretical
Unit 6: Platyhelminthes	SB	6	Theoretical
Unit 7: Nematoda	SB	7	Theoretical
Total Marks -50			
Non-Chordates I Lab; ZOOA-CC-1-1-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of whole mount of Euglena, Amoeba and Paramoecium	SP	10	Practical
Identification with reason & Systematic position of Amoeba, Euglena, Entamoeba, Paramecium, Plasmodium, Balantidium, Vorticella (from the prepared slides)	SB	10	Practical
Identification with reason & Systematic position of Sycon, Poterion (Neptune's Cup), Obelia, Physalia, Aurelia, Gorgonia, Metridium, Pennatula, Madrepora, Fasciola hepatica, Taenia solium and Ascaris lumbricoides.	SB	10	Practical
Staining/mounting of any protozoa/ helminth from gut of Periplaneta sp.	SP	10	Practical
Total Marks -30			

CC – 2
CORE COURSE 2: Molecular Biology

ZOOA-CC1-2-TH	Teacher	ClassHour	Teaching Method
Unit 1: Nucleic Acids	SK	3	Theoretical
Unit 2: DNA Replication	SK	9	Theoretical
Unit 3: Transcription	DG	9	Theoretical
Unit 4: Translation	DG	9	Theoretical
Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA	DG	8	Theoretical
Unit 6: Gene Regulation	SK	7	Theoretical
Unit 7: DNA Repair Mechanisms	SK	2	Theoretical
Unit 8: Molecular Techniques	SK	3	Theoretical
Total Marks -50			
Molecular Biology Lab; ZOOA-CC-1-2-P	**Teacher**	**ClassHour**	**Teaching Method**
Demonstration of polytene and lampbrush chromosome from photograph	SK	10	Practical
Isolation and quantification of genomic DNA from goat liver	SB	10	Practical
Agarose gel electrophoresis for DNA.	SK	10	Practical
Histological staining of DNA and RNA in prepared slides	SK	10	Practical
Total Marks -30			

CBCS System
Semester 2(January-June)
CC – 3
CORE COURSE 3: Non-Chordates II – Coelomates

ZOOA-CC-2-3-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction	SP	2	Theoretical
Unit 2: Annelida	SB	10	Theoretical
Unit 3: Arthropoda	GH	16	Theoretical
Unit 4: Onychophora	SB	2	Theoretical
Unit 5: Mollusca	SP	10	Theoretical
Unit 6: Echinodermata	SB	8	Theoretical
Unit 7: Hemichordata	SP	2	Theoretical
Total Marks -50			

Non-Chordates II Lab, ZOOA-CC-2-3-P	Teacher	ClassHour	Domain	Teaching Method
Study of following specimens: Annelids - Aphrodite, Nereis, Chaetopterus, Earthworm, Hirudinaria	SB	10		Practical
Study of following specimens: Arthropods - Limulus, Palaemon, Balanus, Eupagurus, Scolopendra, Peripatus, Silkworm – life history stages, Termite – members of a colony and Honey bee – members of the colony	SB	10		Practical
Study of following specimens: Molluscs - Dentalium, Patella, Chiton, Pila, Achatina, Pinctada, Sepia, Octopus, Nautilus	SB	10		Practical
Study of following specimens: Echinoderms - Asterias, Ophiura, Clypeaster, Echinus, Cucumaria and Antedon	SB	10		Practical
Anatomy study: Nervours system, Reproductive system (Male & female), Mouth parts & Salivary apparatus in Periplaneta sp.	SP	10		Practical
Total Marks -30				

CC-4 (Semester 2)

CORE COURSE 4: Cell Biology

ZOOA-CC2-4-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Plasma Membrane	DG	7	Theoretical
Unit 2: Cytoplasmic organelles I	SB	5	Theoretical
Unit 3: Cytoplasmic organelles II	DG	7	Theoretical
Unit 4: Cytoskeleton	GH	5	Theoretical
Unit 5: Nucleus	GH	8	Theoretical
Unit 6: Cell Cycle	SK	10	Theoretical
Unit 7: Cell Signalling	SK	8	Theoretical
Total Marks -50			
Cell Biology Lab; ZOOA-CC-2-4-P	**Teacher**	**ClassHour**	**Teaching Method**
Preparation of temporary stained squash of onion/arum root tip to study various stages of mitosis	SK	10	Practical
Study of various stages of meiosis from grasshopper testis	SB	10	Practical
Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.	SK	10	Practical
Preparation of permanent slide to demonstrate: a. DNA by Feulgen reaction b. Cell viability study by Trypan Blue staining	SK	10	Practical
Total Marks -30			

CC-5 (Semester 3)

CORE COURSE 5: Chordata

ZOOA-CC3-5-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Introduction to Chordates	SB	2	Theoretical
Unit 2: Protochordata	SB	7	Theoretical
Unit 3: Agnatha	SB	2	Theoretical
Unit 4: Pisces	SB	7	Theoretical
Unit 5: Amphibia	SB	7	Theoretical
Unit 6: Reptilia	DG	8	Theoretical
Unit 7: Aves	DG	8	Theoretical
Unit 8: Mammals	DG	9	Theoretical
Total Marks -50			
Chordata Lab; ZOOA-CC-3-5-P	**Teacher**	**ClassHour**	**Teaching Method**
Identification with Reasons a) Protochordata: Balanoglossus, Branchiostoma b) Agnatha: Petromyzon c) Fishes: Scoliodon, Sphyrna, Pristis, Torpedo, Mystus, Heteropneustes, Labeo rohita, Exocoetus,Hippocampus, Anabas, Flat fish d) Amphibia: Necturus, Bufo (Duttaphrynus) melanostictus, Rana (Hoplobatrachus) tigerinus, Hyla, Tylototriton, Axolotl larva e) Reptilia:Chelone,Trionyx, Varanus, Hemidactylus, Calotes, Chamaeleon, Draco, Vipera, Naja, Hydrophis, f) Mammalia: Bat (Insectivorous and Frugivorous), Funambulus (Indian Palm squirrel)	SB	30	Practical
Dissection of brain and pituitary – ex situ, digestive and Urino-genital system of Tilapia	DG	10	Practical
Pecten from Fowl head	DG	10	Practical
Power point presentation on study of habit, habitat or behaviour of any one animal by student – for internal assessment only	SP	10	Practical
Total Marks -30			

CC-6 (Semester 3)

CORE COURSE 6: Animal Physiology: Controlling and Co-ordinating System

ZOOA-CC3-6-TH	Teacher	ClassHour	Teaching Method
Unit 1: Tissues	SP	4	Theoretical
Unit 2: Bone and Cartilage	SP	4	Theoretical
Unit 3: Nervous System	SK	10	Theoretical
Unit 4: Muscular system	SK	10	Theoretical
Unit 5: Reproductive System	SK	6	Theoretical
Unit 6: Endocrine System	SP	16	Theoretical
Total Marks -50			
Animal Physiology: Controlling & Coordinating Systems, Lab; ZOOA-CC3-6-P	**Teacher**	**ClassHour**	**Teaching Method**
Recording of cardiac and simple muscle twitch with electrical stimulation	SP	10	Practical
Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells	SK	10	Practical
Study of permanent slides of Mammalian Skin, Spinal cord, Pancreas, Testis, Ovary, Adrenal, Lung, pyloric stomach, cardiac stomach, Thyroid, small intestine and large intestine of mammal (white rat)	SK	10	Practical
Microtomy: Preparation of permanent slide of any five mammalian (Goat/white rat) tissues	GH	10	Practical
Total Marks -30			

CC-7 (Semester 3)
CORE COURSE 7: Fundamentals of Biochemistry

ZOOA-CC3-7-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Carbohydrates	GH	8	Theoretical
Unit 2: Lipids	GH	7	Theoretical
Unit 3: Proteins	GH	10	Theoretical
Unit 4: Nucleic Acids	DG	10	Theoretical
Unit 5: Enzymes	DG	13	Theoretical
Unit 5: Oxidative Phosphorylation	DG	2	Theoretical
Total Marks -50			
Fundamentals of Biochemistry Lab; ZOOA-CC-7-3-P	**Teacher**	**ClassHour**	**Teaching Method**
Qualitative tests for carbohydrates, proteins and lipids	GH	30	Practical
Qualitative estimation of Urea & Uric acid	GH	10	Practical
Paper chromatography of amino acids	SK	10	Practical
Quantitative estimation of water soluble proteins following Lowry Method	SB	10	Practical
Total Marks -30			

CC-8 (Semester 3)

CORE COURSE 8.Comparative Anatomy of Vertebrates

ZOOA-CC4-8-TH	Teacher	ClassHour	Teaching Method
Unit 1: Integumentary System	SK	10	Theoretical
Unit 2: Digestive System	SK	6	Theoretical
Unit 3: Respiratory System	SK	6	Theoretical
Unit 4: Circulatory System	SK	7	Theoretical
Unit 5: Urinogenital System	SP	5	Theoretical
Unit 6: Nervous system and sense organs	SP	8	Theoretical
Unit 7: Skeletal system	SP	8	Theoretical
Total Marks -50			
Comparative Anatomy of Vertebrates Lab; ZOOA-CC4-8-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of placoid, cycloid and ctenoid scales through permanent slides/ photographs	SK	10	Practical
Study of disarticulated skeleton of toad, Pigeon, Guineapig (limb bones, vertebrae, limb and girdle)	SB	10	Practical
Comparative study of heart and brain, with the help of model/picture	SK	10	Practical
Identification of skulls: Pigeon, one herbivore (Guineapig) and one carnivore (Dog) animal	SB	10	Practical
Total Marks -30			

CC-9 (Semester 3)

CORE COURSE 9: Animal Physiology: Life Sustaining Systems

ZOOA-CC4-9-TH	Teacher	ClassHour		Teaching Method
Unit 1: Physiology of Digestion	DG	10		Theoretical
Unit 2: Physiology of Respiration	DG	10		Theoretical
Unit 3: Physiology of Circulation	GH	8		Theoretical
Unit 4: Physiology of Heart	GH	8		Theoretical
Unit 5: Thermoregulation & Osmoregulation	GH	6		Theoretical
Unit 6: Renal Physiology	GH	8		Theoretical
Total Marks -50				
Animal Physiology: Life Sustaining Systems Lab; ZOOA-CC4-9-P	**Teacher**	**ClassHour**		**Teaching Method**
Determination of ABO Blood group	SK	10		Practical
Estimation of haemoglobin using Sahli's haemoglobin meter	SK	10		Practical
Identification of blood cells from human blood	SK	10		Practical
Preparation of haemin crystals and haemochromogen crystals	SK	10		Practical
Identification of blood cells from cockroach haemolymph	GH	5		Practical
Demonstration of blood pressure by digital meter	GH	5		Practical
Total Marks -30				

CC-10 (Semester 4)
CORE COURSE 10: Immunology

ZOOA-CC4-10-TH	Teacher	ClassHour	Teaching Method
Unit 1: Overview of Immune System	SB	3	Theoretical
Unit 2: Innate and Adaptive Immunity	SB	9	Theoretical
Unit 3: Antigens	SB	6	Theoretical
Unit 4: Immunoglobulins	SB	10	Theoretical
Unit 5: Major Histocompatibility Complex	SB	6	Theoretical
Unit 6: Cytokines	DG	3	Theoretical
Unit 7: Complement System	DG	5	Theoretical
Unit 8: Hypersensitivity	DG	4	Theoretical
Unit 9: Vaccines	DG	4	Theoretical
Total Marks -50			
Immunology Lab; ZOOA-CC4-10-P	**Teacher**	**ClassHour**	**Teaching Method**
Demonstration of lymphoid organs (by picture)	SB	10	Practical
Histological study of Bursa fabricius, spleen, thymus and lymph nodes through slides/ photographs	SB	10	Practical
Demonstration of ELISA	SB	10	Practical
Total Marks -30			

CC-11 (Semester 5)
CORE COURSE 11.Ecology

ZOOA-CC5-11-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction to Ecology	SP	4	Theoretical
Unit 2: Population	SB	20	Theoretical
Unit 3: Community	SP	11	Theoretical
Unit 4: Ecosystem	SP	8	Theoretical
Unit 5: Applied Ecology	SP	7	Theoretical
Total Marks -50			
Ecology Lab, ZOOA-CC5-11-P	**Teacher**	**ClassHour**	**Teaching Method**
Determination of population density in a natural/hypothetical community by quadrate method and calculation of Shannon-Weiner diversity index for the same community	SP	10	Practical
Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature,salinity, determination of pH, and Dissolved Oxygen content (Winkler's method) Chemical Oxygen Demand and free CO2	SP	10	Practical
Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/ any place of ecological interest/ ecological uniqueness/ Zoological garden	SB	30	Practical
Total Marks -30			

CC-12 (Semester 5)
CORE COURSE 12.Principle of Genetics

ZOOA-CC5-12-TH	Teacher	ClassHour	Teaching Method
Unit 1: Mendelian Genetics and its Extension	SK	12	Theoretical
Unit 2: Linkage, Crossing Over and Linkage Mapping	SK	8	Theoretical
Unit 3: Mutations	SK	12	Theoretical
Unit 4: Sex Determination	DG	8	Theoretical
Unit 5: Extra-chromosomal Inheritance	DG	2	Theoretical
Unit 6: Genetic Fine Structure	DG	2	Theoretical
Unit 7: Transposable Genetic Elements	DG	6	Theoretical
Total Marks -50			
Principles of Genetics Lab, ZooA-CC5-12-P	**Teacher**	**ClassHour**	**Teaching Method**
Chi-square analyses for genetic ratio test	GH	20	Practical
Identification of chromosomal aberration in Drosophila and man from photograph	SK	10	Practical
Pedigree analysis of some inherited traits in animals	SB	10	Practical
Total Marks -30			

CC-13 (Semester 5)
CORE COURSE 13: Developmental Biology

ZOOA-CC6-13-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Early Embryonic Development	SB	20	Theoretical
Unit 2: Late Embryonic Development	SB	10	Theoretical
Unit 3: Post Embryonic Development	GH	8	Theoretical
Unit 4: Implications of Developmental Biology	GH	12	Theoretical
Total Marks -50			
Developmental Biology Lab; ZOOA-ZooA-CC6-13-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of whole mounts of developmental stages of chick embryo through permanent slides: 24, 48, and 96 hours of incubation	SB	10	Practical
Study of the developmental stages and life cycle of Drosophila	SK	10	Practical
Study of different sections of placenta (photomicropgraph/ slides)	SB	10	Practical
Identification of Invertebrate larva through slides/ photographs of Phylum Annelida, Arthropoda, Mollusca and Echinodermata	GH	10	Practical
Total Marks -30			

CC-14 (Semester 5)
CORE COURSE 14.Evolutionary Biology

ZOOA-CC6-14-TH	Teacher	ClassHour	Domain	Teaching Method
Unit 1: Origin of Life (Chemical basis), RNA world hypothesis	SK	5		Theoretical
Unit 2: Historical review of Evolutionary concepts: Lamarkism, Darwinism and Neo Darwinism	SK	5		Theoretical
Unit 3: Geological time scale, Fossil: types and age determination by Carbon dating, Evolution of horse	GH	6		Theoretical
Unit 4: Natural Selection: Modes with Examples	GH	6		Theoretical
Unit 5: Species concept, Isolating mechanisms, modes of speciation; Speciation by chromosome rearrangement in Drosophila. Adaptive radiation/ macroevolution (exemplified by Galapagos finches).	SK	10		Theoretical
Unit 6: Origin and Evolution of Man, Unique Hominid characteristics contrasted with primate characteristic	SK	2		Theoretical
Unit 7: Population genetics: Hardy-Weinberg Law; factors disrupting H-W equilibrium (Genetic Drift, Migration and Mutation and Selection in changing allele frequencies (only derivations required). Simple problems related to estimation of allelic and gene frequencies	SK	10		Theoretical
Unit 8: Extinction, back ground and mass extinctions, detailed example of K-T extinction	GH	3		Theoretical
Unit 9: Phylogenetic trees, construction and interpretation of Phylogenetic tree using parsimony, convergent and divergent evolution.	GH	5		Theoretical
Total Marks -50				

Evolutionary Biology Lab, ZooA-CC6-14-P	Teacher	ClassHour	Teaching Method
Study of fossils from models/ pictures: Dickinsonia, Paradoxides (Trilobita), Asteroceras (Ammonoid), Pentremites (Blastoid Echinoderm), Ichthyosaur, Archaeopteryx, Cynodont.	SK	10	Practical

Study of homology and analogy from suitable specimens.	GH	10		Practical
Phylogenetic trees, Construction & interpretation of Phylogenetic tree using parsimony, Construction of dendrogram following principles of phenetics & cladistics from a data table	GH	10		Practical
Total Marks -30				

DSE-1 (Semester 5)
DSE1. Parasitology

ZOOA-DSE(A)-5-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction to Parasitology	SB	2	Theoretical
Unit 2: Parasitic Protists	SB	12	Theoretical
Unit 3: Parasitic Platyhelminthes	SB	12	Theoretical
Unit 4: Parasitic Nematodes	SB	12	Theoretical
Unit 5: Parasitic Arthropods	DG	10	Theoretical
Unit 6: Parasite Vertebrates	DG	2	Theoretical
Total Marks -50			
Parasitology Lab, ZOOA-DSE(A)-5-1-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of life stages of Giardia intestinalis, Trypanosoma gambiense, Leishmania donovani, Plasmodium vivax, Plasmodium falciparum through permanent slides/micro photographs	SB	10	Practical
Study of adult and life stages of Schistosoma haematobium, Taenia solium through permanent slides/micro photographs	SB	10	Practical
Study of adult and life stages of Ancylostoma duodenale through permanent slides/micro photographs	SB	10	Practical
Study of monogenea from the gills of fresh/marine fish [Gills can be procured from fish market as by product of the industry]	DG	10	Practical
Study of nematode/cestode parasites from the intestines of Poultry bird [Intestine can be procured from poultry/market as a by-product] & Goat	DG	10	Practical
Submission of a brief report on parasitic vertebrates	DG	10	Practical
Total Marks -30			

DSE-1 (Semester 5)
DSE1. Endocrinology

ZOOA-DSE(B)-5-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction to Endocrinology	GH	6	Theoretical
Unit 2: Hypothalamo-Hypophyseal Axis	GH	12	Theoretical
Unit 3: Peripheral Endocrine Glands	SK	12	Theoretical
Unit 4: Regulation of Hormone Action	SK	12	Theoretical
Unit 5. Non Mammalian Vertebrate Hormone	GH	8	Theoretical
Total Marks -50			
Endocrinology Lab, ZOOA-DSE(B)-5-1-P	**Teacher**	**ClassHour**	**Teaching Method**
Dissect and display of Endocrine glands in laboratory bred rat.	GH	10	Practical
Study of the permanent slides of all the endocrine glands	SK	10	Practical
Tissue fixation, embedding in paraffin, microtomy and slide preparation of any endocrine gland	GH	10	Practical
H-E staining of Histological slides.	GH	10	Practical
Total Marks -30			

DSE-2 (Semester 6)
DSE2. Animal Biotechnology

ZOOA-DSE(A)-6-2-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction	SK	5	Theoretical
Unit 2: Molecular Techniques in Gene manipulation	SK	23	Theoretical
Unit 3: Genetically Modified Organisms	SB	12	Theoretical
Unit 4: Culture Techniques and Applications	SB	10	Theoretical
Total Marks -50			
Animal Biotechnology Lab, ZOOA-DSE(A)-6-2-P	**Teacher**	**ClassHour**	**Teaching Method**
Genomic DNA isolation from E. coli and Plasmid DNA isolation (pUC 18/19) from E. coli	SK	10	Practical
To study following techniques through photographs - Southern Blotting, Northern Blotting, Western Blotting, PCR, DNA fingerprinting	SK	10	Practical
Project report on animal cloning & Application & ethical Issues	SB	30	Practical
Total Marks -30			

DSE-1 (Semester 6)
DSE1. Animal Behaviour and Chronobiology

ZOOA-DSE(B)-6-1-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Patterns of Behaviour	DG	10	Theoretical
Unit 2: Social and Sexual Behaviour	SP	20	Theoretical
Unit 3: Chronobiology & Biological Rhythm	DG	20	Theoretical
Total Marks -50			
Animal Behaviour and Chronobiology Lab, ZOOA-DSE(B)-6-1-P	**Teacher**	**ClassHour**	**Teaching Method**
To study nests and nesting habits of the birds and social insects	DG	10	Practical
To study the behavioural responses of wood lice to dry and humid onditions(demonstration only).	SP	10	Practical
To study geotaxis behaviour in earthworm	SP	10	Practical
To study the phototaxis behaviour in insect larvae.	SP	10	Practical
Visit to Forest/ Wild life Sanctuary/ Biodiversity Park/ Zoological Park to study behavioural activities of animals and prepare a short report	SB	10	Practical
Study of circadian functions in humans (daily eating, sleep and temperature patterns).	DG	10	Practical
Total Marks -30			

SEC-1 (Semester 3)
SEC-1 Apiculture

ZOOA-SEC(A)-3-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Biology of Bees	SK	2	Theoretical
Unit 2: Rearing of Bees	GH	14	Theoretical
Unit 3: Diseases and Enemies	SK	6	Theoretical
Unit 4: Bee Economy	SK	2	Theoretical
Unit 5: Entrepreneurship in Apiculture	GH	6	Theoretical
Total Marks -80			

SEC-1 (Semester 4)

SEC-1.Aquarium Fish Keeping

ZOOA-SEC(B)-4-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction to Aquarium Fish Keeping	GH	2	Theoretical
Unit 2: Biology of Aquarium Fishes	SK	10	Theoretical
Unit 3: Food and feeding of Aquarium fishes	SK	8	Theoretical
Unit 4: Fish Transportation	GH	5	Theoretical
Unit 5: Maintenance of Aquarium	GH	5	Theoretical
Total Marks -80			

TEACHING PLAN (Zoology General)
Academic Session 2018-2019
Under CBCS System
Semester 1(July-December)
CC – 1
CORE COURSE 1.Animal Diversity

ZOOG-CC1-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Kingdom Protista	SP	2	Theoretical
Unit 2: Phylum Porifera	SP	2	Theoretical
Unit 3: Phylum Cnidaria	SP	2	Theoretical
Unit 4: Phylum Platyhelminthes	SP	2	Theoretical
Unit 5: Phylum Nemathelminthes	SP	2	Theoretical
Unit 6: Phylum Annelida	SP	4	Theoretical
Unit 7: Phylum Arthropoda	DG	4	Theoretical
Unit 8: Phylum Mollusca	DG	2	Theoretical
Unit 9: Phylum Echinodermata	DG	4	Theoretical
Unit 10: Protochordates	SK	2	Theoretical
Unit 11: Agnatha	SK	2	Theoretical
Unit 12: Pisces	SK	4	Theoretical
Unit 13: Amphibia	DG	4	Theoretical
Unit 14: Reptiles	DG	4	Theoretical
Unit 15: Aves	DG	4	Theoretical
Unit 17: Mammals	SK	4	Theoretical
Total Marks -50			

Animal Diversity, ZOOG-CC1-1-P

Animal Diversity, ZOOG-CC1-1-P	**Teacher**	**ClassHour**	**Teaching Method**
Identification with reasons of the following specimens:- Amoeba, Euglena, Paramecium, Sycon, Obelia, Aurelia, Metridium, Taenia solium, Ascaris lumbricoides (Male and female), Aphrodite, Nereis, Hirudinaria, Palaemon, Cancer, Limulus, Apis,Chiton, Dentalium, Unio, Sepia, Octopus, Echinus, Cucumaria and Antedon, Balanoglossus, Torpedo, Branchiostoma, Petromyzon, Labeo rohita, Exocoetus, Salamandra, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Bat, Funambulus	DG	20	Practical
Key for Identification of poisonous and non-poisonous snakes	DG	10	Practical
Study of anatomy of digestive system, salivary gland, mouth parts of Periplaneta, Study of reproductive system of female cockroach	SP	10	Practical
Total Marks -30			

CC – 2(Semester-2)
CORE COURSE 2.Comparative Anatomy & Developmental Biology

ZOOG-CC2-2-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Integumentary System	SP	4	Theoretical
Unit 2: Digestive System	SP	4	Theoretical
Unit 3: Respiratory System	SP	6	Theoretical
Unit 4: Circulatory System	SP	6	Theoretical
Unit 5: Urino-genital System	SP	6	Theoretical
Unit 6: Early Embryonic Development	DG	14	Theoretical
Unit 7: Late Embryonic Development	DG	10	Theoretical
Total Marks -50			
Comparative Anatomy & Developmental Biology Lab, ZOOG-CC2-2-P	**Teacher**	**ClassHour**	**Teaching Method**
Osteology: Limb bones, girdle and vertebra of Pigeon & Guineapig, Mammalian skulls: One herbivorous; Guinea pig and one carnivorous; Dog.	SP	20	Practical
Larval stages: Veliger, Nauplius, Trochophore, Mysis	DG	10	Practical
Study of the different types of placenta-histological sections through photomicrographs	DG	10	Practical
Developmental stages of chick embryo: 24 Hrs., 48 Hrs, 72 Hrs., 96 Hrs.	DG	10	
Total Marks -30			

CC – 3(Semester-2)

CORE COURSE 3. PHYSIOLOGY AND BIOCHEMISTRY

ZOOG-CC3-3-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Nerve and muscle	DG	8	Theoretical
Unit 2: Digestion	DG	6	Theoretical
Unit 3: Respiration	DG	6	Theoretical
Unit 4: Cardio-vascular system	DG	6	Theoretical
Unit 5: Excretion	DG	6	Theoretical
Unit 6:Reproduction and Endocrine Glands	GH	10	Theoretical
Unit 7: Carbohydrate Metabolism	GH	4	Theoretical
Unit 8: Lipid metabolism	GH		Theoretical
Unit 9: Protein Metabolism	GH	4	Theoretical
Unit 10. Enzyme	GH	2	Theoretical
Total Marks -50			
PHYSIOLOGY AND BIOCHEMISTRY Lab; ZOOG-CC3-3-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland.	GH	10	Practical
Study of permanent histological sections of mammalian duodenum, liver, lung, kidney.	GH	10	Practical
Qualitative test for carbohydrate samples	GH	10	Practical
Total Marks -30			

CC – 4(Semester-2)

CORE-COURSE 4.Genetics & Evolutionary Biology

ZOOG-CC4-4-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1:Mendelian Genetics and its Extension	DG	10	Theoretical
Unit 2: Linkage, Crossing Over	DG	8	Theoretical
Unit 3: Mutation	DG	8	Theoretical
Unit 4: Sex determination	DG	8	Theoretical
Unit 5: Origin of Life	GH	2	Theoretical
Unit 6: Evolutionary Theories	GH	6	Theoretical
Unit 7: Process of Evolutionary changes	GH	4	Theoretical
Unit 8: Speciation	GH	4	Theoretical
Total Marks -50			
Genetics and Evolutionary Biology Lab ZOOG-CC4-4-P	**Teacher**	**ClassHour**	**Teaching Method**
Verification of Mendelian Ratio using Chi square test.	GH	10	Practical
Identification of Human Aneuploidy using photo graph of karyotype.	GH	10	Practical
Phylogeny of horse with diagram of limb and skull.	GH	10	Practical
Study and identification of Darwin Finches from photographs	GH	10	Practical
Visit to natural history museum and submission of report.	SB	20	Practical
Total Marks -30			

Discipline specific courses
Semester-5
DSE-A
Applied Zoology.ZOOG-DSE-A-5-1-TH

Applied Zoology.ZOOG-DSE-A-5-1-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit I: Host & Parasite Relationship	SP	2	Theoretical
Unit 2: Epidemiology of Diseases	SP	5	Theoretical
Unit 3: Parasitic Protozoa	SP	7	Theoretical
Unit 4: Parasitic Helminthes	SP	8	Theoretical
Unit 5: Insect of Economic Importance	SP	8	Theoretical
Unit 6: Insect of Medical Importance	DG	2	Theoretical
Unit 8: Animal Husbandry	DG	6	Theoretical
Unit 9: Poultry Farming	DG	6	Theoretical
Unit 10: Fish Technology	DG	6	Theoretical
Total Marks -50			
Applied Zoology. ZOOG-DSE-A-5-1-P	**Teacher**	**ClassHour**	**Teaching Method**
Study of Plasmodium vivax, Entamoeba histolytica, Trypanosoma gambiense, Ancylostoma duodenale and Wuchereria bancrofti and their life stages through permanent slides/photomicrographs or specimens	DG	10	Practical
Study of arthropod vectors associated with human diseases: Pediculus, Culex, Anopheles, Aedes	DG	10	Practical
Study of insect damage to different plant parts/stored grains through damaged products/photographs	SP	10	Practical
Identifying feature and economic importance of Helicoperva; Heliothis armigera,Papilio demoleus, Pyrilla perpusilla, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum	DG	10	Practical
Visit to poultry farm or animal breeding centre. Submission of visit report	SP	10	Practical
Maintenance of freshwater aquarium(demonstration only)	SP	10	Practical
Total Marks -30			

Semester-6
DSE-B
Ecology& Wild life Biology;ZOOG-DSE-B-6-2-TH

Ecology& Wild life Biology;ZOOG-DSE-B-6-2-TH	**Teacher**	**ClassHour**	**Teaching Method**
Unit 1: Introduction to Ecology	SP	4	Theoretical
Unit 2: Population	DG	20	Theoretical
Unit 3: Community	DG	11	Theoretical
Unit 4: Ecosystem	SP	10	Theoretical
Unit 5: Wild Life	SP	5	Theoretical
Total Marks -50			
Ecology& Wild life Biology;ZOOG-DSE-B-6-2-P	**Teacher**	**ClassHour**	**Teaching Method**
Identification of flora, mammalian fauna, avian fauna	DG	10	Practical
Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses)	SP	10	Practical
Familiarization and study of animal evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, etc.	DG	10	Practical
Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method), Chemical Oxygen Demand and free CO2	SP	10	Practical
Total Marks -30			

Skill Enhancement Elective Courses (SEC)
SEMESTER –3
SEC-A
APICULTURE; ZOOG-SEC-A-3-1-TH

APICULTURE; ZOOG-SEC-A-3-1-TH	Teacher	ClassHour	Teaching Method
Unit 1: Biology of Bees	GH	2	Theoretical
Unit 2: Rearing of Bees	GH	14	Theoretical
Unit 3: Diseases and Enemies	GH	6	Theoretical
Unit 4: Bee Economy	SP	2	Theoretical
Unit 5: Entrepreneurship in Apiculture	SP	6	Theoretical
Total Marks -80			

SEMESTER – 4
SEC-B
AQUARIUM FISH KEEPING; ZOOG-SEC-B-4-2-TH

AQUARIUM FISH KEEPING; ZOOG-SEC-B-4-2-TH	Teacher	ClassHour	Teaching Method
Unit l: Introduction to Aquarium Fish Keeping	GH	2	Theoretical
Unit 2: Biology of Aquarium Fishes	GH	10	Theoretical
Unit 3: Food and feeding of Aquarium fishes	GH	8	Theoretical
Unit 4: Fish Transportation	SP	5	Theoretical
Unit 5: Maintenance of Aquarium	SP	5	Theoretical
Total Marks -80			

SEMESTER –5
SEC-A
Sericulture; ZOOG-SEC-A-5-3-TH

Sericulture; ZOOG-SEC-A-5-3-TH	Teacher	ClassHour	Teaching Method
Unit 1: Introduction	DG	6	Theoretical
Unit 2: Biology of Silkworm	DG	4	Theoretical
Unit 3: Rearing of Silkworms	DG	10	Theoretical
Unit 4: Pests and Diseases	SP	7	Theoretical
Unit 5: Entrepreneurship in Sericulture	SP	3	Theoretical
Total Marks -80			

SEMESTER –6
SEC-B
Medical diagnosis; ZOOG-SEC-B-6-4-TH

Medical diagnosis; ZOOG-SEC-B-6-4-TH	Teacher	ClassHour	Teaching Method
Unit 1: Diagnostics Methods Used for Analysis of Blood	DG	8	Theoretical
Unit 2: Diagnostic Methods Used for Urine Analysis	DG	4	Theoretical
Unit 3: Non-infectious Diseases	DG	6	Theoretical
Unit 4: Infectious Diseases	DG	3	Theoretical
Unit 5: Clinical Biochemistry	SP	1	Theoretical
Unit 6: Clinical Microbiology	SP	1	Theoretical
Unit 8: Tumours	DG	2	Theoretical
Unit 9: Visit to Pathological Laboratory and Submission of Project	DG	5	Theoretical
Total Marks -80			

NAME OF TEACHERS
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