

DEPARTMENT OF BOTANY CHANDIDAS MAHAVIDYALAYA

A Govt. Aided Degree College Affiliated to the University of Burdwan
UGC Accredited under section 2(f) & 12(B) [1979] * NAAC Accredited in 2016



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Ref. No.:

Date:

Teaching Module of Three- Year BOTANY Degree under CCFUP as per NEP- 2020

Semester-I Paper: CC/GE-1 (BIODIVERSITY) (THEORY)				
Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Microbes	Virus	Discovery, gen. str. Replication (general account)	2	Lecture, webinar, group discussion, inquiry-based learning, ICT
		DNA Virus, lytic & lysogenic cycle, RNA virus (TMV)	2	Do
		Economic importance	1	Do
	Bacteria	Discovery, gen. char. & Cell structure	2	Do
		Reproduction- vegetative, asexual & recombination	2	Do
		Economic importance	1	Do
Phycology	Algae	Gen. chr.: Ecology & distribution	2	Do
		Range of thallus organisation & reproduction	2	Do
		Classification	1	Do
		Morphology & life cycle of <i>Chlamydomonas</i> & <i>Oedogonium</i>	2	Do
		Morphology & life cycle of <i>Chara</i> & <i>Fucus</i>	2	Do
		Morphology & life cycle of <i>Polysiphonia</i>	1	Do
		Economic importance	1	Do
		Introduction, gen. characters, ecology & significance	2	Do
		Range of thallus organisation & cell wall composition	2	Do

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Mycology	Fungi	Nutrition, reproduction & classification	2	Do
		True fungi: gen. characters, ecology & significance	2	Do
		Life cycle of <i>Rhizopus</i> & <i>Ascobolus</i>	1	Do
		Life cycle of <i>Puccinia</i> & <i>Agaricus</i>	1	Do
		Symbiotic association Of Lichen, gen., account, reproduction & significance.	1	Do
		Ectomycorrhiza & endomycorrhiza & their significance	1	Do
Moss	Bryophytes	Gen. characters, adaptation to land plant	2	Do
		Classification, range of thallus organisation	2	Do
		Morphology, anatomy & reproduction of <i>Marchantia</i> & <i>Funaria</i>	2	Do
		Ecology & economic importance of bryophytes with special mention of <i>Sphagnum</i>	2	Do
Vascular Cryptogams	Pteridophytes	General character, classification, early land plants	2	Do
		Classification	1	Do
		Morphology, anatomy & reproduction of <i>Lycopodium</i>	1	Do
		 of <i>Selaginella</i>	1	Do
		 of <i>Equisetum</i>	1	Do
		 of <i>Pteris</i>	1	Do
Naked seeded Plant	Gymnosperm	General characteristics, classification	2	Do
		Morphology, anatomy & reproduction of <i>Cycas</i>	1	Do
		 of <i>Pinus</i>	1	Do
		Economic importance of Gymnosperm	1	Do


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Semester-I Paper: CC-1A/GE-1 (PRACTICAL)				
Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Phycology	Algae	Dissection, mounting, description, drawing and identification of <i>Nostoc</i> , <i>Oedogonium</i> & <i>Chara</i>	1	Wet lab work, demonstration, YouTube video, ICT projection
Mycology	Fungi	 <i>Ascobolus</i> & <i>Puccinia</i>	1	Do
Moss	Bryophytes	 <i>Riccia</i> , <i>Marchantia</i> & <i>Funaria</i>	1	Do
Vascular Cryptogams	Pteridophytes	Dissection, mounting, description, drawing and identification of <i>Lycopodium</i> , <i>Selaginella</i> & <i>Pteris</i>	1	Do
Naked seeded Plant	Gymnosperm	 <i>Cycas</i> leaflet & <i>Pteris</i>	1	Do
Permanent slide	Permanent slide	Identification of all above mentioned genera in theoretical syllabus from permanent slides.	1	Do
Microbiology	Bacteria	Sterilization techniques, simple staining of Bacteria with Methylene blue/ Carbol Fuchsin..... curd.	1	Do




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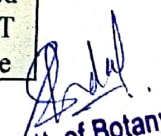
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Three- Year BOTANY General Degree Course (CBCS) Teaching Module

Semester-III Paper: CC-IC/GE-III (ANATOMY & EMBRYOLOGY) (THEORY)				
Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Meristematic & permanent tissue	Tissue	Root & shoot apical meristem	4	Lecture, webinar, group discussion, inquiry-based learning, ICT classes, slide show
		Simple and complex tissue	4	Do
Organs	Root, stem & leaf	Structure of monocot root, stem & leaf	2	Do
		Structure of dicot root, stem & leaf	2	Do
Secondary growth	Vascular cambium	Structure, function & seasonal activity of cambium	3	Do
	Growth	Secondary growth in root & stem	2	Do
	Wood	Heart wood & sap wood	1	Do
Adaptive & protective system	Protective system	Epidermis, cuticle & stomata	3	Do
	Adaptive system	General account of adaptation in xerophytes & Hydrophytes	2	Do
Structural organization of Flower	Anther & pollen	Structure of anther & pollen	2	Lecture, webinar, group discussion, inquiry-based learning, ICT classes, slide



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				& photograph show
	Ovule	Structure & types of ovules	2	Do
	Embryo sac	Types of embryo sac	1	Do
		Organization & ultrastructure of mature embryo sac	2	Do
pollination & Fertilization	Pollination	Mechanisms and adaptations	2	Do
	Fertilization	Double fertilization	1	Do
	Seed	Structure, appendages & dispersal mechanisms	3	Do
Embryo & Endosperm	Endosperm	Types, structure & functions	3	Do
	Embryo	Dicot & monocot embryo	3	Do
	Embryo & Endosperm	Relationship	1	Do
Apomixis & Polyembryony	Apomixis	Definition, types & practical applications	3	Do
	Polyembryony	Definition, types & practical applications	3	Do

Semester-III				
Paper: CC-IC/GE-III (ANATOMY & EMBRYOLOGY)				
(PRACTICAL)				
Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Meristematic tissue	Tissue	Study of meristem through permanent slides & photographs	1	Wet lab work, demonstration, YouTube video, field study, slide show
Permanent tissue	Tissue	Tissue (Parenchyma, collenchyma & sclerenchyma), Macerated xylary elements, phloem (permanent slides, photographs)	1	Do
Organ	Stem	Monocot (<i>Zea mays</i>), Dicot (<i>Helianthus</i>) & secondary (<i>Helianthus</i>) – only permanent slide	1	Do
	Root	Monocot (<i>Zea mays</i>), Dicot (<i>Helianthus</i>) & secondary (<i>Helianthus</i>) – only permanent slide	1	Do

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	Leaf	Dicot & Monocot (only permanent slide)	1	Do
Adaptive anatomy	Xerophyte & Hydrophyte	<i>Nerium</i> leaf, <i>Hydrilla</i> stem	1	Wet lab work, demonstration, YouTube video, field study, slide show
Structural organization of flower	Ovule	Types: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous- through permanent slides/ photographs	1	Do
	Embryo sac	<i>Polygonum</i> (monosporic), types of embryo sac development (permanent slides/photographs)	1	Do
Pollination & Fertilization		Pollination types & seed dispersal mechanisms (including appendages, aril, caruncle (photographs & specimens)	1	Do

Semester-III
Paper: SEC-I (HERBAL TECHNOLOGY)

Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Herbal Technology	Herbal medicine	History & scope, definition of medicinal plants	2	Lecture, webinar, group discussion, inquiry-based learning, ICT classes, field study
		Role of medicinal plants in Siddha system of medicine	2	Do
		Cultivation, harvesting, processing, storage marketing & utilization of medicinal plants	2	Do
	Pharmacognosy	Systematic position medicinal uses of the following herbs incurring various ailments - Tulsi	2	Do
		 - Ginger	2	Do
		 - Indian Goose berry	2	Do
	Phytochemistry	Active principles & method of their testing- identification and utilization of the medicinal herbs -Catharanthus sp. (cardiotonic)	2	Do
		 Withania somnifera (drugs acting on nervous system)	2	Do
		 Centella asiatica (Memory booster)	2	Do
		Drug adulteration - types, method of drug evaluation.	2	Lecture, webinar, group discussion, inquiry-based learning, ICT

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Herbal Technology	Analytical pharmacognosy			classes, field study
		Biological testing of herbal drugs	2	Do
		Phytochemical screening tests for secondary metabolites of alkaloids, flavonoids	2	Do
		 Of steroids, triterpenoids, phenolic compounds	2	Do
	Medicinal Plants	Medicinal plant banks, micro propagation of important species of neem -Herbal foods feature of pharmacognosy	2	Do
		 of Tulsi -Herbal foods feature of pharmacognosy	2	Do

Semester-V Paper: DSE-1A (ECONOMIC BOTANY & BIOTECHNOLOGY) (THEORY)				
Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Origin of cultivated plants	Cultivated plants	Concept of centres of origin	2	Lecture, webinar, group discussion, inquiry-based learning, ICT classes, field study
		Importance with reference to Vavilov's work	2	Do
Cereals	Wheat	Origin, morphology & uses	2	Do
Legumes	Gram	General account with special reference to Gram	2	Do
	Soyabean	General account with special reference to Soyabean	2	Do
Spices	Clove	General account with special reference to Clove (Botanical name, family, part used, morphology & uses)	2	Do
	Black pepper	General account with special reference to Black pepper (Botanical name, family, part used, morphology & uses)	2	Do
Beverages	Tea	Morphology, uses	1	Do
		Processing	1	Do
Oils & fats	Ground nut	General description	1	Do
		Cultivation & uses	2	Do
Fibre yielding plants	Cotton	General description	1	Do
		Botanical name, family, part used, morphology & uses	2	Do
Introduction to Biotechnology	Biotechnology	History, definition, aim & scope	3	Do

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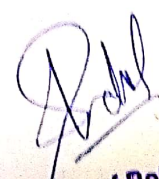


		Contribution of Indian scientist	1	Do
Plant tissue culture	Tissue culture	Micropropagation	2	Do
		Haploid production through androgenesis.	1	Do
		Haploid production through gynogenesis	1	Do
		Brief account of embryo culture with their application	2	Do
		Brief account of endosperm culture with their application	2	Do
Recombinant of DNA technology	Recombinant of DNA	Enzymes in recombinant DNA technology	3	Do
		Cloning vector	3	Do
		DNA library	2	Do
		PCR, DNA fingerprinting	2	Do
		Application of recombinant DNA technique	2	Do

(PRACTICAL)

Unit Name	Topic	Sub-Topic	No. of Classes	Mode of teaching
Study of economically important plants	Economic important plants	Study of economically important plants of wheat, gram, black-pepper, clove & ground nut through specimens & section	1	Wet lab work, demonstration, YouTube video, field study, slide show
Familiarization	Tissue culture	Familiarization with basic equipment in tissue culture	1	Do
Study through photographs	Photographs	Anther culture, somatic embryogenesis, endosperm & embryo culture, micropropagation	1	Do
Recombinant DNA technology	Conception generation about molecular technique	PCR, Blotting techniques	2	Wet lab work, demonstration, YouTube video, field study, slide show
		AGE & PAGE protocol	2	




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