

ACADEMIC SESSION-2023-2024

SEM-I(MAJOR)

PAPER	TEACHER	DETAILED SYLLABUS
MJ-1T	PROF.SASWATI ROY(S.ROY)	MJ-1T: Plants and Microbial Diversity and its Evolution Credits 03 UNIT-I. Introduction to microbial diversity; Whittaker's five-kingdom system and Carl Richard Woese's three-domain system. UNIT-II. Virus: General characteristics; classification (Baltimore), idea about viroids and prions; detailed structure T4-phage and SARS-COV2, lytic and lysogenic cycle; Economic importance of viruses.
	PROF.MANIKLAL PATI(M.P)	UNIT-III. Bacteria: General characteristics; Types-archaeobacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts); Bergey's classification, Cell structure; Nutritional types; vegetative and Reproductive structure - asexual and recombination (conjugation, transformation and transduction).Economic importance of bacteria.
	PROF.RACHANA BERA(R.B)	UNIT-IV. Algae: General characteristics; Ecology and distribution; range of thallus organization; Classification (Van Den Hoek, 1995), reproduction and life cycles of <i>Nostoc</i> , <i>Oedogonium</i> , <i>Chara</i> , and <i>Polysiphonia</i> .
	PROF.BISWAJIT PRADHAN(B.P)	UNIT-V. Fungi: General characteristics; Affinities with plants and animals; Thallus organization; Heterothallism and parasexuality. Classification Ainsworth (up to Order). Life cycles of <i>Synchytrium</i> , <i>Saccharomyces</i> , <i>Ascobolus</i> , <i>Agaricus</i> . Symbiotic associations: Lichen and Mycorrhiza. Economic importance.
	PROF.MAMTAJ KHATUN(M.K)	UNIT-VI. Archegoniate: Unifying features of archegoniate, Bryophytes: General characteristics; Adaptations to land habit; Range of thallus organization. Idea about different orders. Outline classification (Mishler), Morphology, anatomy and reproduction of <i>Marchantia</i> , <i>Porella</i> , <i>Anthoceros</i> , <i>Notothylas</i> and <i>Funaria</i> ; Economic importance with special reference to <i>Sphagnum</i>
	PROF.SHAMBHU RANA(S.R)	UNIT-VII. Pteridophytes: General characteristics; Idea about different orders. Classification (Sporne, 1975), Early land plants (<i>Rhynia</i> and <i>Asteroxylon</i>)Morphology, anatomy and reproduction of <i>Lycopodium</i> , <i>Selaginella</i> , <i>Equisetum</i> and <i>Pteris</i> . Economic importance.
	PROF.SASWATI ROY(S.ROY)	UNIT-VIII. Gymnosperms: General characteristics, idea about different orders, Classification (Sporne, 1965), morphology, anatomy and reproduction of <i>Cycas</i> , <i>Pinus</i> and <i>Gnetum</i> ; Economic importance. UNIT-IX. Palaeobotany: Geological time scale and important events, Types of plant fossils - impressions, compressions, petrification. Stromatolites, Factors for fossilization

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MJ-1P	PROF.MANIKLAL PATI(M.P)	<p>MJ-1P: Plants and Microbial Diversity and its Evolution (Practical) Credits 01</p> <p>Course contents:</p> <ol style="list-style-type: none">1. Electron micrographs/Models of viruses – T-Phage and Sars-CoV2,2. Sketches of Lytic and Lysogenic Cycle.3. Study of curd organisms curd through Gram staining.4. Endospore staining.5. Study of vegetative and reproductive structures of <i>Nostoc</i>, <i>Oedogonium</i> and <i>Polysiphonia</i>.6. Study of reproductive structures of <i>Ascobolus</i>, and <i>Agaricus</i>.7. Study of reproductive structure of <i>Saccharomyces</i> and <i>Penicillium</i>.8. Lichens: Photomicrographs of different types of Lichens.9. <i>Marchantia</i>- Morphology of thallus, whole mount of rhizoids & Scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (all temporary slides), vertical section of antheridiophore, archegoniophore, longitudinal section of sporophyte (all permanent slides).10. <i>Anthoceros</i>- Morphology of thallus, dissection of sporophyte (to show spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).11. <i>Pogonatum</i>- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); Permanent slides showing antheridial and archegonial heads, longitudinal section of capsule and protonema.12. <i>Selaginella</i>- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).13. <i>Equisetum</i>- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores, transverse section of rhizome (all permanent slide).14. <i>Pteris</i>- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).15. <i>Cycas</i>- Morphology (leaf), vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).

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MJ-1P	PROF.MANIKLAL PATI(M.P)	<p>16. <i>Pinus</i>- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), transverse section of Needle (temporary slide), transverse section of stem, longitudinal section of / transverse section of male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), longitudinal section of female cone, tangential longitudinal section & radial longitudinal sections stem (permanent slide).</p> <p>17. <i>Gnetum</i>- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (all permanent slide)</p> <p>18. Study of fossil genera - <i>Rhynia</i>, <i>Cooksonia</i>, <i>Lepidodendron</i> and <i>Lepidocarpon</i> through photographs</p>
SEC 1	PROF.RACHANA BERA(R.B)	<p>SEC 1: Biofertilizers Credits 03 SEC1P: Field Geology I- Basic Field Training Full Marks: 50 Course Outline: Unit- 1: General account about the microbes used as biofertilizer – Rhizobium – isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis. Unit- 2: <i>Azospirillum</i>: isolation and mass multiplication – carrier based inoculant, associative effect of different microorganisms. <i>Azotobacter</i>: classification, characteristics – crop response to <i>Azotobacter</i> inoculum, maintenance and mass multiplication. Unit- 3: Cyanobacteria (blue green algae), <i>Azolla</i> and <i>Anabaena azollae</i> association, nitrogen fixation, factors affecting growth, blue green algae and <i>Azolla</i> in rice cultivation. Unit- 4: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants. Unit-5: Organic farming – Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.</p>

SEM-I(MINOR/GE)

PAPER	TEACHER	DETAILED SYLLABUS
MI – 1T	PROF.SASWATI ROY(S.ROY)	<p>MI – 1T: Plant Science-I Credits 03</p> <p>UNIT-I.Introduction to microbial world- Whittaker’s five-kingdom system</p> <p>UNIT-I.Virus: General characteristics, classification (Baltimore), Economic importance.</p> <p>UNIT-I.Bacteria: General characteristics, Bergey’s Classification, Economic importance.</p>
	PROF.SHAMBHU RANA(S.R)	<p>UNIT-I.Algae: General characteristics; habitat, classification (Van Den Hoek, 1995), lifecycle patterns of <i>Volvox</i> and <i>Batrachospermum</i>, Economic importance.</p> <p>UNIT-I.Fungi: General characteristics, Classification (Ainsworth, up to Order), life cycle patterns of <i>Rhizopus</i> and <i>Agaricus</i>, economic importance. Brief account of lichen and mycorrhiza.</p>
	PROF.RACHANA BERA(R.B)	<p>UNIT-II.Bryophytes: General characteristics, classification (Proskauer, 1957), morphology, anatomy and reproduction of <i>Riccia</i>, <i>Anthoceros</i> and <i>Funaria</i>, economic importance of bryophytes.</p>
	PROF.SHAMBHU RANA(S.R)	<p>UNIT-II.Pteridophytes: General characteristics, Classification (Sporne, 1975), morphology, anatomy and reproduction of <i>Lycopodium</i>, <i>Adiantum</i> and <i>Marsilea</i>. Economic importance</p>
	PROF.SASWATI ROY(S.ROY)	<p>UNIT-III.Gymnosperms: General characteristics, Classification (Sporne, 1965), morphology, anatomy and reproduction of <i>Cycas</i> and <i>Pinus</i>. Economic importance.</p> <p>UNIT-III.Paleobotany: Geological time scale and important events, Types of plant fossils.</p>
MI /B1P	PROF.BISWAJIT PRADHAN(B.P)	<p>MJ /B1P: Practical Credits 01</p> <p>Course Outline:</p> <ol style="list-style-type: none"> 1. Electron micrographs/Models of viruses – T-Phage and Sars-CoV2. 2. Study of Curd organisms through Gram staining. 3. Study of vegetative and reproductive structure of <i>Volvox</i>, and <i>Batrachospermum</i>. 4. Study of morphology and reproductive structure of <i>Rhizopus</i> and <i>Agaricus</i>. 5. Study of morphology of thallus and reproductive structure of <i>Riccia</i>, <i>Anthoceros</i> and <i>Funaria</i>. 6. Study of morphology vegetative and reproductive structure of <i>Lycopodium</i>, <i>Adiantum</i> and <i>Marsilea</i>. 7. Study of morphology and vegetative structure of <i>Cycas</i> and <i>Pinus</i>. 8. Study of fossil types (impressions, compressions, petrification).