DEPARTMENT OF BOTANY

ABHEDANANDA MAHAVIDYALAYA, SAINTHIA, BIRBHUM, WB

Academic plan (suggestive) (2017-18) SEM I (Hons). w. e. f - 02.08.2017

SEMESTERS: 1ST (ONE)

COURSES	**CORE COURSE I (CC1)**	**MICROBIOLOGY AND PHYCOLOGY**		
COURSES	**CORE COURSE II (CC2)**	**ARCHEGONIATE (Bryophyte-Pteridophyte-Gymnosperms)**		
TOTAL MARKS	**75**	**Theory-40**	**Practical-20**	**Internal -15**
TOTAL CREDIT	**06**	**Theory-4**	**Practical-2**	**------**
TOTAL NO OF LECTURES	**60+30**	**60**	**30**	**------**
OBJECTIVES	To have a tentative course of action well in advance through the said academic plan to be able to ✓ Execute the new CBCS ✓ Finish syllabus and conduct evaluations on time to the satisfaction of both the student and teacher ✓ Integrate the practical with theory syllabus			
EVALUATION METHOD:	**C1** -5 Marks of the total marks (Class test/Assignment) **C2**-5 Marks of the total marks (Class test/Assignment) **C3**-40 marks [(10x2)+(5x2)+(2x5)] Semester 1 Final Examination by University		**Attendance** (5 Marks)	
C1 CLASSES	8th week from the beginning of the semester, completion of 1/3rd of the total course syllabus around 3rd week of September 2017			
C2 CLASSES	16th week from the beginning of semester completion of 2/3rd of syllabus around 3rd week of November 2017			
C3 CLASSES	21st to 23rd week full syllabus around 3rd week of December 2018			
CORE COURSE I (CC1)--- MICROBIOLOGY AND PHYCOLOGY				
1st-8th week	**THEORY:-** **Unit 1:** Introduction to microbial world; **Unit 2:** Viruses	**THEORY:-** **Unit 4:** Algae;	**PRACTICAL:-** **Microbiology**-Aseptic method **Phycology**- Study and Camera Lucida drawings of	

			vegetative and reproductive structures
9th-16th week	**Unit 2:** Viruses **Unit 3:** Bacteria	**Unit 5: Cyanophyta and Xanthophyta;** **Unit 6: Chlorophyta and Charophyta**	**Microbiology** Simple staining; Differential staining: Gram staining. **Phycology-** Identification of all the genera included in the theoretical syllabus from Permanent slides (vegetative and reproductive structures).
17th-22nd week	**End part of Unit 3: Bacteria**	**Unit 7: Phaeophyta and Rhodophyta**	**Microbiology** Microscopic examination of bacteria from natural habitats: curd and root nodules of leguminous plants. **Phycology** Repetation of workout and identification
23rd-24th	Special classes If needed, to boost up the students for final examination	Special classes If needed, to boost up the students for final examination	If needed
Last week	**Prepared the students for examination ethics, techniques and boost up the mental stability.**		
Suggested books	**Algae** 1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi. 2. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition. 3. Text book of botany. Vol 1. New central book agency 4. College botany		
	Microbiology 1. Pelczar, M.J. (2001). Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi. 2. Text book of botany. Vol 1. New central book agency 3. General microbiology. C.B Power & H.F. Daginawala		
CORE COURSE II (CC2)--- ARCHEGONIATE (Bryophyte-Pteridophyte)			
1st-8th week	**THEORY:-** **Bryophyte** **Unit 1:** Introduction Unifying features of archegoniates; Transition and adaptation to land habit;Alternation of generations.	**THEORY:-** **Pteridophyte** **Unit 4:** Introduction. General characteristics; Classification (Pichi Sermolli, 1977 upto order); early land plants (*Cooksonia* and *Rhynia*).	**PRACTICAL:-** **Bryophyte** ***Marchantia-*** 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 (from permanent slides). ***Anthoceros-*** Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (from permanent slide). **Pteridophyte** ***Lycopodium-*** Morphology, whole mount of leaf, transverse section of stem (temporary slide), longitudinal section of strobilus (from permanent slide). ***Selaginella-*** 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 (from permanent slide).
9th-16th week	**Unit 2: Bryophytes** General characteristics & Classification [upto order] of Schuster (1968); Adaptations to land habit; Rangeof thallus organization.	**Unit 5: Type Studies-Pteridophytes** Morphology, anatomy and reproduction of *Lycopodium, Selaginella, Equisetum, Pteris* and *Marsilea* (Developmental details not to be included). Apogamy, and apospory, heterospory and seed habit, telome theory, stelar evolution; Ecological and economic importance	**Bryophyte** ***Pellia*** - Study from Permanent slides. **Pteridophyte** ***Equisetum-*** Morphology, transverse section of intemode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (temporary slide), transverse section of rhizome (from permanent slide).

			8. ***Pteris-*** 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 (from permanent slide)
17th-22nd week	**Unit 3: Type Studies-Bryophytes** Morphology, anatomy, reproduction and evolutionary trends in *Riccia*, *Marchantia*, *Pellia*, *Anthoceros.*	**Unit 6: Gymnosperms** General characteristics, classification (Stewart and Rothwell 1993, up to order), morphology, anatomy and reproduction of *Cycas*,	**Bryophyte** ***Funaria-*** Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule. **Gymnosperms** ***Cycas-*** Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide). **Gymnosperms** ***Pinus-*** Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones),
23rd-24th	*Sphagnum* and *Funaria* (developmental stages not included). Ecological and economic importance of bryophytes (a brief account).	*Pinus* and *Gnetum* (Developmental details not to be included); Ecological and economic importance.	**Bryophyte** Practice **Gymnosperms** ***Pinus-*** transverse section of Needle, 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 (Permanent slide), tangential longitudinal section & radial longitudinal sections stem (permanent slide). ***Gnetum*-** Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)
Last week	**Prepared the students for examination ethics, techniques and boost up the mental stability.**		
Suggested books	**Bryophyte** **1.** Vanderpoorten, A. & Goffinet, B. (2009) Introduction to Bryophytes. Cambridge University. **2.** Text book of botany. Vol 1. New central book agency **3.** College botany Vol II		
	Pteridophyte **1.** Vashistha, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India. **2.** Text book of botany. Vol 1. New central book agency **3.** College botany Vol II **Gymnosperms** 1. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi,India. 2. Text book of botany. Vol II. New central book agency 3. College botany Vol II		

WEEK WISE ACADEMIC PLAN FOR THEORY CBCS HONS SYLLABUS

WEEKS	DATE	CC1 (**Unit 1;2;3**) DB	CC1 (**Unit 4;5;6;7)** AB	DATE	CC2 (**Unit 1;2;3)** DB	CC2 (**Unit 1;4;5;6)** KKM	Remarks
1	02.08 .2017	Introduction	Introduction	02.08 .2017	Introduction	Introduction	
2		Introduction to microbial world;	General characteristics; range of thallus organization;		Archegoniates	Land habit	
3		Microbial nutrition, growth and metabolism.	Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus),		Bryo-General character	Pterido-General character-Classification	
4		Economic importance of viruses with reference to vaccine production, role in medicine and as causal organisms of plant diseases.	lagella; methods of reproduction;		Classification	Cooksonia-Rhynia	
5		Economic importance of bacteria with reference to their role in agriculture and	Classification; criteria, general concept of endosymbiosis, system of Fritsch' 1935 (only upto class), and evolutionary classification of Lee' 2008 (only upto groups);		Land habit	Lycopodium	
6		industry (fermentation and antibiotics).	Classification;		Range-thallus organization	Selaginella	
7		Viruses Discovery, physiochemical and biological characteristics; classification (Baltimore)	Significant contributions of important phycologists (F.E. Fritsch & M.O.P. Iyengar);		*Riccia* Sp	Equisetum	

8		general structure with special reference to TMV, T2-Phage,viroids and prions; lytic and lysogenic cycle. Bacteria - Discovery, general characteristics; Principles in Bacterial Taxonomy,	Role of algae in the environment, agriculture, biotechnology and industry.		*Marchantia* Sp	Pteris	
9	20.09. 17	**Exam CC1**	**Exam CC1**	21. 09. 17	**Exam CC2**	**Exam CC2**	
10		**Marks deposit**	**Marks deposit**		**Marks deposit**	**Marks deposit**	16 .01. 18
11		Bergey's Man. of Syst. Bact.; 2nd Ed. - 2001-05;	**Cyanophyta** Ecology and occurrence; Cell structure; Reproduction, Genetic recombination (in Cyanophyta); **Xanthophyta** Morphology and life-cycle of *Vaucheria*		Pellia	Marsilea	
12		Types-Archaea, Eubacteria, wall-less forms (mycoplasma and spheroplasts);	**Chlorophyta and Charophyta** General characteristics; Occurrence; Cell structure. Life-cycles of *Volvox*, *Zygnema*, *Oedogonium*, *Coleochaete* and *Chara.*		Anthoceros Sphagnum Funaria	Apospory-Apogamy; Heterospory-Seed habit Telome theory-Stelar evolution Eco.Imp-Pteridophytes	
13		**Puja vacation**					
14		**Puja vacation**					
15		**Puja vacation**					
16		**Puja vacation**					
17	16.11.17	**Exam CC1**	**Exam CC1**	17.11.17	**Exam CC2**	**Exam CC2**	
18		**Marks deposit**	**Marks deposit**		**Marks deposit**	**Marks deposit**	16.01.18

19		Cell structure; Bacterial Chromosome &	**Phaeophyta** Characteristics; Occurrence; Cell structure; Reproduction,		Eco.Imp-Bryophytes	Gymno-General characters-Clssification Cycas	
20		extra-chromosomal genetic elements;	life-cycles of *Fucus*			Pinus	
21		Nutritional types;	**Rhodophyta** Characteristics; Occurrence; Cell structure; Reproduction			Gnetum	
22		Vegetative Reproduction and genetic recombination (conjugation, transformation and transduction),	life-cycles of *Polysiphonia*			Ecological-economic importance	
23		Endospore.					
24		**Final Exam**	**Final Exam**		**Final Exam**	**Final Exam**	

WEEK WISE ACADEMIC PLAN FOR PRACTICAL CBCS HONS SYLLABUS

WEEKS	DATE	CC1 (**Unit 1;2;3**) DB	CC1 (**Unit 4;5;6;7**) AB	DATE	CC2 (**Unit 1;2;3)** DB	CC2 (**Unit 1;4;5;6)** KKM	Remarks
1	26.07.2017	**Microbiology-** Introduction	**Phycology-** Introduction	26.07.2017	Introduction	Introduction	
2		Aseptic method. Sterilization technique by Autoclaving, hot air oven and surface sterilization.	Study and Camera Lucida drawings of vegetative and reproductive structures		***Marchantia-*** 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 (from permanent slides).	***Lycopodium-*** Morphology, whole mount of leaf, transverse section of stem (temporary slide), longitudinal section of strobilus (from permanent slide).	
3		Preparation of standard bacteriological medium (Nutrient agar, Nutrient broth and glucose - peptone medium).	Study and Camera Lucida drawings of Nostoc		***Marchantia-***	***Selaginella-*** 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 (from permanent slide).	
4		Preparation of slant and plates.	Study and Camera Lucida drawings of Scytonema		***Anthoceros-*** Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (from permanent slide).	***Lycopodium-***	
5		Subculturing of pure	Study and Camera Lucida		***Anthoceros-***	***Selaginella***	

		bacteriological culture.	drawings of Zygnema				
6		Pure culture technique: dilution streak method.	Study and Camera Lucida drawings of Oedogonium		***Marchantia-***	Practice	
7		Simple staining; Differential staining:	Study and drawings of Chara		***Anthoceros-***	Practice	
8		Gram staining.	Study and Camera Lucida drawings of Vaucharia		Practice	Practice	
9		Microscopic examination of bacteria from natural habitats: curd	Identification of all the genera included in the theoretical syllabus from Permanent slides (vegetative and reproductive structures).		Practice	***Equisetum-*** Morphology, transverse section of intemode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (temporary slide), transverse section of rhizome (from permanent slide).	
10		Microscopic examination of bacteria from natural habitats: Root nodules of leguminous plants	Identification		***Pellia*** - Study from Permanent slides	***Equisetum-***	
11		Microscopic examination of bacteria from natural habitats: curd (Repetation)	Identification		***Pellia***	***Pteris-*** 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 (from permanent slide).	
12		Microscopic examination of bacteria from natural habitats: Root nodules of leguminous plants (Repetation)	Identification		Practice	***Pteris-***	
13		**Puja vacation**					
14		**Puja vacation**					
15		**Puja vacation**					
16		**Puja vacation**					
17			Permanent slides preparation		***Funaria-*** Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule.	***Cycas-*** Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).	
18			Repetation of Identification		***Funaria-***	***Cycas-***	
19			Repetation of Identification		***Funaria-***	***Pinus-*** Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones),	

						transverse section of Needle, 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 (Permanent slide), tangential longitudinal section & radial longitudinal sections stem (permanent slide).	
20			Repetation of Identification		***Funaria-***	***Pinus-***	
21					Practice	***Gnetum-*** Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)	
22					Practice	***Gnetum-***	
23							
24							