DEPARTMENT OF BOTTANY

ABHEDANANDA MAHAVIDYALAYA, SAINTHIA, BIRBHUM, WB

Academic plan (suggestive) (2018-19) SEM 2 (Hons). w. e. f - 17.01.2018

SEMESTERS: 2nd (TWO)

COURSES	**CORE COURSE III (CC III)**	**Mycology and Phytopathology**		
COURSES	**CORE COURSE IV (CC IV)**	**Morphology & Anatomy of Angiosperms**		
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)			**Attendance** (5 Marks)
	C2-5 Marks of the total marks (Class test/Assignment)			
	C3-40 marks [(10x2)+(5x2)+(2x5)] Semester 1 Final Examination by University			

C1 CLASSES	8th week from the beginning point, completed 1/3rd of the total course of the syllabus around 3rd week of March 2018		
C2 CLASSES	16th week from the 3rd week of January, 2/3rd of the syllabus completed, around 3rd week of May 2018.		
C3 CLASSES	21st to 23rd week full syllabus completed around 3rd week of Jun 2018		
CORE COURSE III (CCIII)--- Mycology and Phytopathology			
1st-8th week	**THEORY:-** **Unit 1:** **Introduction to true fungi** General characteristics; Affinities with plants and animals; Thallus organization; Cell wall composition;Nutrition; Classification (Alexopoulos & Mims, 1979). **Unit 2:** **Chytridiomycota and Zygomycota** Characteristic features; Thallus organisation; Life cycle with reference to *Synchytrium* and *Rhizopus* **Unit 3:** **Ascomycota** General characteristics, sexual reproduction and development of ascus and ascospores, types of ascocarp; Phenomenon of Heterokaryosis and parasexuality in asexual members; Life cycle of *Saccharomyces*, *Talaromyces*, *Neurospora* and *Ascobolus.*	**THEORY:-** **Unit 9:** **Phytopathology** Terms and concepts; General symptoms; Geographical distribution of diseases; Symptomology; Koch's Postulate; Host-Pathogen relationships; Disease cycle and environmental relation; Types of diseases, host defense mechanism; prevention and control of plant diseases (biological & chemical), and role of Quarantine. Bacterial diseases-Citrus canker Bacterial blight of rice.	**PRACTICAL:-** **Fungi** Study of the following genera and their identification: *Rhizopus*, *Talaromvces*, *Alterneria*, **Plant Pathology** Identification of diseases prescribed in the theoretical syllabus. Study of the following diseases: White rust, Rust of wheat/*Justicia*., Loose smut of wheat
9th-16th week	**Unit 4:** **Basidiomycota** General characteristics; Phenomenon Of	Viral diseases-Tobacco Mosaic virus.	**Fungi** Study of the following genera and their

	dikaryotization, development of basidia and basidiospores and basidiocarp, Life cycle of *Puccinia* (Physiological Specialization) and *Agaricus*, Bioluminescence, FairyRings and Mushroom Cultivation. **Unit 5:** **Allied Fungi** General characteristics; Status of Slime molds, Occurrence; Types of plasmodia. **Unit 6:** **Oomycota** General characteristics; Life cycle of *Phytophthora* and *Albugo.*	Fungal diseases & Control - Late blight of potato. Ergot of rye; Black stem rust of wheat, Loose smut of wheat,	Identification: *Ascobolus,* *Agaricus* *Polypoms.* **Plant Pathology** Herbarium specimens of bacterial diseases; Citrus Canker; Angular leaf spot of cotton, Viraldiseases: TMV, Vein clearing, Fungal diseases: Early & Late blight of potato, Black stem rust of wheat and White rust of crucifers.
17th-22nd week	**Unit 7:** **Symbiotic associations** Lichen - Occurrence; General characteristics; Range of thallus organization; Nature of associations of algal and fungal partners; Reproduction; Mycorrhiza-Ectomycorrhiza, Endomycorrhiza with special reference to VAM and their significance. **Unit 8:** **Applied Mycology** Role of fungi in biotechnology; Application of fungi in food industry (Flavour & texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical	Covered smut of wheat, White rust of crucifers.	**Fungi** Identification of all the macroscopic and microscopic genera included in the theoretical syllabus. **Plant Pathology** Mycorrhizae-Ecto and Endo mycorrhizae (photographs only)

	preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides).		Practice
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	**Fungi** 1. Text book of botany. Vol 1. New central book agency 2. College Botany Vol II 3. Studies in Botany Vol I		
	Plant pathology 1. Text book of botany. Vol 1. New central book agency 2. College Botany Vol II 3. Studies in Botany Vol I		
CORE COURSE IV (CC IV)--- Morphology & Anatomy of Angiosperms			
1st-8th week	**THEORY:-** **Morphology of Angiosperms** **Unit 7:** **Leaves and Inflorescence** Leaves-types, phyllotaxy and modifications; Inflorescence-Types and evolution **Unit 8:** **Flower, Fruit and Seed** Types of flower; Aestivation,	**THEORY:-** **Anatomy of Angiosperms** **Unit 1:** **Introduction and scope of Plant Anatomy** Applications in systematics, forensics and pharmacognosy. **Unit 2:** **Structure and Development of Plant Body** Internal organization of plant body: The three tissue systems, types of cells and tissues; Development of plant body: a brief account. **Unit 3:** **Tissues** Classification of tissues; Simple and complex tissues (no phylogeny); cyto-differentiation of tracheary elements and sieve elements; Cell wall and it's secondary growth; Pits and plasmodesmata; Ergastic	**PRACTICAL:-** 1. Study of anatomical details through permanent slides/temporary stain mounts/ macerations/museum specimens with the help of suitable examples. 2. Study of the secondary structures of stem of the following genera: *Bignonia, Dracaena (Cordyline), Boerhaavia* and *Strychnos.*

		substances. Hydathodes, cavities, lithocysts and laticifers.	
9th-16th week	placentation - types and evolution. Floral formula & floral diagram; Adhesion-Cohesion of floral parts, micro and mega gameto- and sporogenesis; embryosac, Fruits -types, Fruit & Seed dispersal.	**Unit 4:** **Apical meristems** Evolution of concept of organization of shoot apex (Apical cell theory, Histogen theory, Tunica Coipus theory, continuing meristematic residue, cytohistological zonation); Types of vascular bundles; Structural differences of dicot and monocot stem, root & leaf, Kranz anatomy. Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Endodermis, exodermis and origin of lateral root. **Unit 5:** **Vascular Cambium and Wood** Structure, function and seasonal activity of cambium; Secondary growth in root and stem with special reference to *Bignonia, Dracaena (Cordvline),*	Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates;xylem fibres. (from permanent slides) Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres, (from permanent slides) Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular, lenticels.
17th-22nd week	Embryosac, Fruits -types, Fruit & Seed dispersal.	*Boerhaavia and Strychnos.* Types of rays and axial parenchyma; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. Development and composition of periderm; General account of Rhytidome and lenticels. **Unit 6:** **Adaptive and Protective Systems** Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni-and multicellular, Glandular and nonglandular, two examples of each), stomata (classification),	Root: monocot, dicot, secondary growth (from permanent slides). Stem: monocot, dicot - primary and secondary growth; periderm (from permanent slides); Leaf: Different variations; C4 leaves (Kranz anatomy). Cystolith, lithocysts and Raphides. Types of inflorescence, placentation and fruits.
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	Special classes If needed, to boost up the students for final

			examination
Last week	**Prepared the students for examination ethics, techniques and boost up the mental stability.**		
Suggested books	**Morphology of Angiosperms** 1. Text book of botany. Vol II. New central book agency 2. Plant Taxonomy. O.P.Sharma. Tata McGraw-Hill. 3. Studies in Botany		
	Anatomy of Angiosperms 1. Evert, R.F. (2006). Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function and Development. John Wiley and Sons, Inc. 2. Text book of botany. Vol II. New central book agency 3. Studies in Botany		

WEEK WISE ACADEMIC PLAN FOR THEORY CBCS HONS SYLLABUS

WEEKS	DATE	CC III (**Unit 1;2;3;4;5;6;7;8**) DB	CCIII (**Unit 9**) DB	DATE	CCIV (**Unit 1;2;3;4;5;6**) AB	CCIV (**Unit 7;8**) KKM	Remarks
1	17.01.2018	**Mycology** **Unit 1:** Introduction to true fungi	**Unit 9: Phytopathology** Introduction	17.01.2018	**Anatomy of Angiosperms** **Unit 1:** Introduction and scope of Plant Anatomy Applications in systematics, forensics and pharmacognosy	**Morphology of Angiosperms** **Unit 7:** Introduction	
2		General characteristics; Affinities with plants and animals; Thallus organization; Cell wall composition;Nutrition;	Terms and concepts; General symptoms; Geographical distribution of diseases;		.**Unit 2:** Structure and Development of Plant Body Internal organization of plant body: The three tissue systems, types of cells and tissues;	Leaves Leaves-types, phyllotaxy ,	
3		Classification (Alexopoulos & Mims, 1979).	Symptomology; Koch's Postulate; Host-Pathogen relationships; Disease cycle and environmental relation;		Development of plant body: a brief account.	Inflorescence modifications; Inflorescence-Types	
4		**Unit 2: Chytridiomycota and Zygomycota** Characteristic features; Thallus organisation; Life cycle with reference to *Synchytrium* and *Rhizopus*	Types of diseases, host defense mechanism;		**Unit 3: Tissues** Classification of tissues; Simple and complex tissues (no phylogeny); cyto-	Inflorescence evolution	
5		**Unit 3: Ascomycota** General characteristics, sexual reproduction and development of ascus and ascospores,	prevention and control of plant diseases (biological & chemical),		differentiation of tracheary elements and sieve elements;	**Unit 8:** Flower, Types of flower	
6		. types of ascocarp; Phenomenon of Heterokaryosis and parasexuality in	and role of Quarantine.		Cell wall and it's secondary growth;	Aestivation Fruit	

		asexual members; Life cycle of *Saccharomyces,*					
7		*Talaromyces, Neurospora* and	Bacterial diseases-Citrus canker		Pits and plasmodesmata; Ergastic substances.	Fruits types	
8		*Ascobolus*	Bacterial blight of rice.		Hydathodes, cavities, lithocysts and laticifers	Fruits types	
9	27.03.18	**Exam CC III**	**Exam CC III**	27.03.18	**Exam CC IV**	**Exam CC IV**	
10		**Marks deposit**	**Marks deposit**		**Marks deposit**	**Marks deposit**	20.06.18
11		**Unit 4: Basidiomycota** General characteristics; Phenomenon Of dikaryotization, development of basidia and basidiospores and basidiocarp,	Viral diseases- Tobacco Mosaic virus.		**Unit 4: Apical meristems** Evolution of concept of organization of shoot apex (Apical cell theory, Histogen theory, Tunica Coipus theory, continuing meristematic residue, cytohistological zonation);	placentation - types placentation evolution.	
12		Life cycle of *Puccinia* (Physiological Specialization) and *Agaricus*, Bioluminescence, FairyRings	Fungal diseases & Control -		Types of vascular bundles; Structural differences of dicot and monocot stem,	Floral formula & floral diagram	
13		Mushroom Cultivation. **Unit 5: Allied Fungi** General characteristics; Status of Slime molds, Occurrence; Types of plasmodia.	Late blight of potato.		root & leaf, Kranz anatomy. Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory);	Adhesion-Cohesion of floral parts,	
14		**Unit 6: Oomycota** General characteristics; Life cycle	Ergot of rye;		Quiescent centre; Endodermis, exodermis and origin of lateral root.	micro sporogenesis	
15		of *Phytophthora* and	Black stem rust of wheat,		**Unit 5:** Vascular Cambium and Wood Structure, function and seasonal activity of	mega gametogenesis embryosac	

					cambium; Secondary growth in root and stem		
16		*Albugo.*	Loose smut of wheat,		with special reference to *Bignonia, Dracaena (Cordvline),*	Fruit & Seed dispersal.	
17	12.05.18	**Exam CC1**	**Exam CC1**	12.05.18	**Exam CC2**	**Exam CC2**	
18		**Marks deposit**	**Marks deposit**		**Marks deposit**	**Marks deposit**	20.06.18
19		**Unit 7: Symbiotic associations** Lichen - Occurrence; General characteristics; Range of thallus organization; Nature of associations of algal and fungal partners; Reproduction; Mycorrhiza- Ectomycorrhiza, Endomycorrhiza with special reference to VAM and their significance.	Covered smut of wheat,		*Boerhaavia and Strychnos.* Types of rays and axial parenchyma; Sapwood and heartwood;	mega gametogenesis embryosac	
20		**Unit 8: Applied Mycology** Role of fungi in biotechnology; Application of fungi in food industry (Flavour & texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins);	White rust of crucifers		Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology.	mega gametogenesis embryosac	
21		Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers);	Special classes If needed, to boost up the students for final examination		Development and composition of periderm; General account of Rhytidome and lenticels.	Special classes If needed, to boost up the students for final examination	
22		Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides).	Special classes If needed, to boost up the students for final examination		**Unit 6: Adaptive and Protective Systems** Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni-and	Special classes If needed, to boost up the students for final examination	

					multicellular,		
23		Special classes If needed, to boost up the students for final examination	Special classes If needed, to boost up the students for final examination		y	Special classes If needed, to boost up the students for final examination	
24		**Final Exam**	**Final Exam**		**Final Exam**	**Final Exam**	

WEEK WISE ACADEMIC PLAN FOR PRACTICAL CBCS HONS SYLLABUS

WEEKS	DATE	CC III (**Unit 1;2;3;4;5;6;7;8**) DB	CCIII (**Unit 9)** DB	DATE	CCIV (**Unit 1;2;3;4;5;6)** AB	CCIV (**Unit 7;8)** KKM	Remarks
1		**FUNGI** Study of the following genera and their identification: *Rhizopus*,	**PLANT PATHOLOGY** Identification of diseases prescribed in the theoretical syllabus.		**Anatomy of Angiosperms** Study of anatomical details through permanent slides/temporary stain mounts/ macerations/museum specimens with the help of suitable examples.	Types of inflorescence, placentation and fruits.	
2		Study of the following genera and their identification: *Talaromvces*,	Identification of diseases prescribed in the theoretical syllabus.		Study of anatomical details through permanent slides/temporary stain mounts/ macerations/museum specimens with the help of suitable examples.	Types of inflorescence, placentation and fruits.	
3		Study of the following genera and their identification: *Alterneria*,	Study of the following diseases: White rust, Rust of wheat/*Justicia*,		Study of anatomical details through permanent slides/temporary stain mounts/ macerations/museum specimens with the help of suitable examples.	Types of inflorescence, placentation and fruits.	
4		. Study of the following genera and their identification: *Ascobolus*,	Study of the following diseases: loose smut of wheat.		Study of anatomical details through permanent slides/temporary stain mounts/ macerations/museum specimens with the help of suitable examples.	Types of inflorescence, placentation and fruits.	
5		Study of the following genera and their identification: *Agaricus* and	Herbarium specimens of bacterial diseases; Citrus Canker; Angular leaf spot of cotton,		Study of the secondary structures of stem of the following genera: *Bignonia, Dracaena (Cordyline), Boerhaavia*	Types of inflorescence, placentation and fruits.	
6		Study of the following genera and their identification:	Viral diseases: TMV,		and *Strychnos.*	Types of inflorescence, placentation and fruits.	

		Polypoms.					
7		practice	Practice		Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates;xylem fibres. (from permanent slides)	Types of inflorescence, placentation and fruits.	
8		practice	Practice		Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates;xylem fibres. (from permanent slides)	Types of inflorescence, placentation and fruits.	
9							
10		.					
11		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	Vein clearing, Fungal diseases: Early blight of potato		Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres, (from permanent slides)	Practice	
12		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	& Late blight of potato,		Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres, (from permanent slides)	Practice	
13		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	Black stem rust of wheat and		Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular, lenticels.	Practice	
14		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	White rust of crucifers.		Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular, lenticels.	Practice	

15		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	Mycorrhizae- Ecto and Endo mycorrhizae (photographs only)		Root: monocot, dicot, secondary growth (from permanent slides).	Practice	
16		Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	Mycorrhizae- Ecto and Endo mycorrhizae (photographs only)		Root: monocot, dicot, secondary growth (from permanent slides).	Practice	
17							
18							
19		Practice	Practice		Stem: monocot, dicot - primary and secondary growth; periderm (from permanent slides);	Practice	
20		Practice	Practice		Leaf: Different variations; C4 leaves (Kranz anatomy).	Practice	
21		Practice	Practice		Cystolith, lithocysts and Raphides.	Practice	
22		Practice	Practice		Practice	Practice	
23		Practice	Practice		Practice	Practice	
24		Special classes If needed, to boost up the students for final examination	Special classes If needed, to boost up the students for final examination		Special classes If needed, to boost up the students for final examination	Special classes If needed, to boost up the students for final examination	