University of Kerala

Discipline	**BOTANY**				
Course Code	**UK4DSCBOT201**				
Course Title	**LOWER CRYPTOGAMS, PHYTOPATHOLOGY AND MICROBIOLOGY**				
Type of Course	**DSC**				
Semester	**IV**				
Academic Level	**200 - 299**				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	04	03 Hours	-	02 Hours	05 hours
Pre-requisites	UK3DSCBOT201				
Course Summary	To familiarize the students with lower cryptogams (algae, fungi, and lichens) and microbes; their diversity, structure, and life cycle; and their economic and ecological significance. Students will get an idea about plant diseases and their management.				

Module	Unit	Content	Hrs
I		**Phycology**	**11**
	1	General characteristics and classification of algae (Fritch,1935) up to class level- Thallus organization and Pigment composition- Economic importance of algae.	
	2	Significant features, thallus structure, and life cycle of algae in the following groups with special reference to the type mentioned: Cyanophyceae (*Nostoc)* Chlorophyceae (*Oedogonium*) Bacillariophyceae (*Pinnularia*) Phaeophyceae (*Sargassum*) Rhodophyceae(*Polysiphonia*)	
II		**Mycology**	**10**
	3	General characteristics and classification of Fungi(G.C. Alexopoulos, 1996); Economic importance of Fungi.	
	4	Significant features, thallus structure and life cycle of the genera mentioned in each group Zygomycetes -*Rhizopus* Ascomycetes - *Penicillium* Basidiomycetes – *Puccinia, Agaricus*	
III		**Lichenology**	**03**
	5	General account, ecological and economic importance; types of Lichen - Crustose, Foliose and Fruticose.	
	6	Morphology, anatomy, and reproduction of *Usnea*	
IV		**Plant pathology**	**06**

	7	Definition and Classification of plant diseases based on causative organisms and symptoms, Host-parasite interaction, disease triangle, and phytoalexins.	
	8	Study of the following diseases with emphasis on symptoms, disease cycle, and control measures - Leaf mosaic of Tapioca, Citrus Canker, Blast disease of Paddy	
	9	Brief account of the following Fungicides- Bordeaux mixture, Lime sulphur, Tobacco decoction, Neem cake & oil.	
V	**Microbiology**		**15**
	10	History –Contributions of Robert Hook, Antony Van Leeuwenhoek, Louis Pasteur, Robert Koch.	
	11	Bacteria: Morphology and classification- Ultrastructure, reproduction- Gram staining- Economic importance. Mycoplasma & Actinomycetes(General account)	
	12	Virus: Structure and reproduction in general. Bacteriophages: Structure and reproduction (Lytic and Lysogenic cycle)- Harmful activities of viruses.	
	13	Applied microbiology -Nitrogen fixation, Bio-fertilizers, Pasteurization, types (canning, drying), soil microorganisms – bacteria (cyanobacteria and actinobacteria), algae, fungi, and viruses (brief account only), Role of microbes in soil fertility:the rhizosphere-Phyllosphere.	

Practicals		
	1. Gram staining of bacteria. 2. Make micro preparations of vegetative and reproductive structures of the algal and fungal types mentioned in the syllabus. 3. Identify the algal specimens up to the generic level and make labeled sketches of the specimens observed 4. Identification of Different Lichens mentioned in the syllabus. 5. Identify the causal organism and symptoms of Leaf mosaic of Tapioca, Citrus Canker, and Blast disease of Paddy. 6. Prepare the fungicides- Bordeaux mixture &Tobacco decoction 7. Algal and fungal sample collection from different localities.	**30**

Suggested Reading

1. Alexopoulos, C.J., Mims, C.W. and Blackwell, M.1996. Introductory Mycology.
2. John Wiley & Sons. Inc., New York, 868.
3. Ganguli, H.C. and Kar. AK. 2001 College Botany and Vol.ll Books and Allied Press LId Kolkta. India
4. Lee, R.E.2008. Phycology, Cambridge University Press, Cambridge. 4th edition.
5. Pelczar et al.2011. Microbiology, 8th edition, Tata McGraw-Hill Co, New Delhi.
6. Smith, G. M.1972.Cryptogamic Botany. Vol. 1 & 2. Tata McGraw Hill Publishing Co. Ltd.
7. Vasista P.R.2017.Botany for Degree student, Algae, S. Chand Publication, New Delhi