



## **Course Outline Form**

## **ODD SEMESTER 2019**

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*Dear Student: Course outlines are intended to provide students with an overall plan for a course to enable them to function efficiently and effectively in the course.*

*Academic Programs  
MSc Microbiology  
EMEA College  
Kondotty*

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## Course Outline : MBG1C04. Agricultural Microbiology and Plant Pathology (2019-2020)

Name of the Stream	Science
Name of the Programme	MSc Microbiology
Name of the Course	MBG1C04. Agricultural Microbiology and Plant Pathology
Nature of the Course	Core Course
Semester	First
Lecturer(s)	Yoonus. P
Name of the Coordinator	Yoonus. P
Year	2019-2020
No of Credits	2
No of Contact Hours	54
Course Description	<p>This course Introduces the essential fundamentals of Agricultural Microbiology. Agricultural microbiology which is the most important field of Microbiology for the economic and medical importance it holds. This field explores various aspects like the genetics, physiology, molecular biology, virulence &amp; pathogenicity and other aspects of the plant microbes. It deals with the infectious agents of the microbes, improvements and resistance of the agricultural crops, economic importance and the beneficial aspects of the normal agricultural flora. A complete study and understanding is crucial in application of the microbes for augmentation of soil nutrients, which is increasing the resistance of plants against the plant pathogen.</p>
Course Objectives	<p>This course is designed to</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Introduce the essential fundamentals of Agricultural Microbiology.</li> <li><input type="checkbox"/> Describe the concepts of Agricultural Microbiology such as Soil Environment, Major plant diseases caused by fungi, bacteria, viruses, and nematodes, and plant defence mechanisms.</li> <li><input type="checkbox"/> Introduce biopesticides &amp; biofertilizers and plant microbe-interactions.</li> </ul>
Course Outcome	<ul style="list-style-type: none"> <li><input type="checkbox"/> On completion of the course the student will be able to:</li> <li><input type="checkbox"/> 1. Know the diverse group of microbial plant pathogens</li> <li><input type="checkbox"/> 2. Understand the mechanisms of action and importance of biocontrol agents</li> <li><input type="checkbox"/> 3. Understand the nutrient sources and cycles</li> <li><input type="checkbox"/> 4. Develop an understanding about the beneficial effect of soil microorganisms on plant community</li> <li><input type="checkbox"/> 5. Know the application of microbiology</li> <li><input type="checkbox"/> Students will be aware of importance of biofarming.</li> </ul>
Assessment Method	<p>Assignments</p> <p>Class Tests</p> <p>Unit Tests</p> <p>Practical Tests</p> <p>Term Exam</p> <p>Seminars</p> <p>Lab Experiments</p>

Teaching Methods Used	Powerpoint Slides
Textbook	
References	Agricultural Microbiology – Rangaswami Agricultural Microbiology – Subha rao Biopesticides, use and delivery – Hall and Menn Biotechnology of Integrated pest management – Persley Microbiology – Prescott Plant breeding – B.D. Singh Plants, genes and crop biotechnology – Chrispels & Sadava
Internet Resources	<a href="http://www.agrimoon.com/">http://www.agrimoon.com/</a> <a href="http://agriculturenotesadda.blogspot.com/">http://agriculturenotesadda.blogspot.com/</a> <a href="https://lecturenotes.in/">https://lecturenotes.in/</a> <a href="https://microbiologyonlinenotes.com/">https://microbiologyonlinenotes.com/</a>

### Internal Exam Pattern

Items	Marks/20	Marks/15
Assignment	4	3
Test Paper(s)/Viva voce	8	6
Seminar/Presentation	4	3
Class Room Participation based on Attendance	4	3
<b>Total</b>	<b>20</b>	<b>15</b>

### External Exam Pattern

Question Type	No of Question	Marks/Question	Total Marks
Short Questions(2-3 Sentences)	15	2	Ceiling 25
Paragraph / Problem Type	8	5	Ceiling 35
Essay Type	2 out of 4	10	20
<b>Total</b>			<b>80</b>
<b>Time</b>			<b>2.5 hrs</b>

Graduate Attributes	<p><b>Name of the Course:</b> MBG1C04. Agricultural Microbiology and Plant Pathology</p> <p><b>Knowledge</b></p> <p><b>Academic and Intellectual Skills</b></p> <p>Self Learning</p> <p>Cognitive Skills</p> <p><b>Professional Skills</b></p> <p>Critical and Analytical Skills</p> <p>Cross Cultural Skills</p> <p>Problem Solving Skills</p> <p>Research Skills</p> <p>Entrepreneur Aptitude</p> <p><b>Personal Skills</b></p> <p>Creative Thinking</p> <p>Lifelong Learning</p> <p>Application Skills</p> <p><b>Attitude and Values</b></p> <p>Social Responsibility</p> <p>Ethical Commitment</p>
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### Course Schedule

Microbial interactions: Microbial flora of soil. Plant – Microbe interactions :-	Week 1
.Nitrogen fixation- Symbiotic and non-symbiotic, physiology and genetics of nitrogen fixation. Mycorrhizae, Rhizosphere and Phylloplane microorganisms. Animal-Microbe	Week 2
Interactions - Rumen microflora, Nematophagous fungi, Bioluminescent bacteria, Termite	Week 3
nutrition	Week 4
Applications of microbes in agriculture: Biofertilizers. Symbiotic nitrogen fixation -	Week 5
(Rhizobium, Frankia). Symbiotic nutrient mobilizers - Endomycorrhizae and	Week 6
Ectomycorrhizae. Non symbiotic microbes – Azotobacter. Associative Symbiosis –	Week 7
Azospirillum. Cyanobacteria (Nostoc, Gloeocapsa), Azolla-Anabaena System. Mass production	Week 8
of biofertilizers. Bio pesticides- bacterial, fungal and viral. Advantages and disadvantages of	
bio pesticides over the chemical counter parts. GM crops and its	
significance.	

<p>Plant pathology: Components of disease (disease pyramid). Symptoms, epidemiology and control of common plant diseases. Fungal diseases- Late blight of potato, Downy mildew of grapes, Powdery mildew of cucurbits, Early blight of potato, Rice blast, Red rot of sugarcane, Sheath blight of rice, Rusts of wheat. Bacterial diseases – Crown gall disease and Ti plasmid, BLB of rice, Red stripe of sugarcane, Bacterial wilt of Banana (Moko disease), Soft rot of potato, Citrus canker, Ratoon stunting of sugarcane.</p>	Week 9
	Week 10
	Week 11
	Week 12
<p>Mycoplasma – Coconut root wilt. Viral diseases – Tobacco mosaic, Yellow vein mosaic of Bhindi, Rice Tungro, Leaf curl of papaya, Bunchy top of banana, Potato spindle tuber, Coconut Cadang- Cadang. Nematode- Potato cyst nematode. Plant defense mechanisms- Structural, biochemical, SAR and ISR.</p>	Week 13
	Week 14
	Week 15
	Week 16
	Week 17
	Week 18

**Contact Details**

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