



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Science Colleges
Semester-2 (M.Sc.)

Subject: Agricultural Microbiology-MS CMB12511

Type of course: Minor

Prerequisite: These courses provide the knowledge about different types of radiation and their effects on cells and tissues as well as learn about immune system and immunity of humans.

Rationale: To teach students about the radiation effects and immunity on living cells.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
3	0	0	3	60	30	10	00	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Unit No	Course content	Hrs	% Weightage
1	<p>Chapter:1 Agriculture Sustainability</p> <ul style="list-style-type: none"> • Soil fertility and phenomenon of mineralization and immobilization of elements, factors affecting soil fertility. • Plant growth promoting rhizobacteria (PGPR). • Crop rotation and Mixed crops. • Entomopathogenic fungi. 	15	25%



2	<p>Chapter:2 Pathology of plants</p> <ul style="list-style-type: none"> • Types of plant pathogens. • Modes of entry of plant pathogens into plant hosts. • Plant disease resistance. 	10	25%
3	<p>Chapter:3 Plant diseases</p> <ul style="list-style-type: none"> • Concept of disease in plants • Symptoms of plant diseases caused by fungi, bacteria and viruses. • Plant diseases- Downey mildew of bajra, Citrus canker, Tikka disease of groundnut, Red rot of sugarcane. • Principles of plant disease control. 	10	25%
4	<p>Chapter:4 Agriculture Biotechnology</p> <ul style="list-style-type: none"> • Introduction to Plant Biotechnology. • Plant tissue culture – Methods and applications. • Genetically modified crops and better crop yield – BT cotton, Flavr Savr Tomato, Golden rice. 	10	25%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	<p>Analysis Faculty will assign topics and Group of students will analyze the topic and write a 250 word report and upload them to GMIU web Portal.</p>	10
2	<p>Microbial Isolation and Identification Faculty will assign task to students and students can actively participate in isolating and identifying microbes from agricultural samples, such as soil, plants, or water and results upload on the GMIU web portal.</p>	10
3	<p>Agricultural Microbial Community analysis Students will analyze the community found in agricultural area and will submit report on to the GMIU web portal.</p>	10
4	<p>Field Visit Students will visit field related to agricultural area and 250 word report will be submit on GMIU web portal.</p>	10



5	Plantation Activity To enhance agriculture students will plant different plants and upload picture on GMIU web portal.	10
Total		50

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	40%	30%	10%	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Define and explain the principles of sustainable agriculture.
CO2	Acquire knowledge about the various plant diseases, including fungal, bacterial, viral, and nematode diseases.
CO3	Identify and describe various Plant diseases with their control parameters
CO4	Equip deep understanding of the principles, techniques, and applications of biotechnology in agriculture.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment



Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

- 1) Subbarao N S, (1993), Biofertilizers in Agriculture and Forestry, 3rd edn, Oxford and IBH
- 2) Prescott L, Harley J P, and Klein D A, (2008). Microbiology, 7th edn. Wm C. Brown - McGraw Hill, Dubuque, IA
- 3) R. C. Dubey (1993), A Textbook of Biotechnology, Edition: 5th Publisher: S Chand & Company Pvt. Ltd.

