

SHORT COURSE IN BIOFERTILIZER TECHNOLOGY

Department of Biological Sciences

Faculty of Applied Sciences

RAJARATA UNIVERSITY OF SRI LANKA

Course Name: Biofertilizer Technology

The Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka has planned to conduct a short course in Biofertilizer Technology. This short course is mainly designed for senior- level position holders with a special focus on fertilizer, agriculture, and allied sectors.

Rationale:

Restoring the sustainability of farming in Sri Lanka through ecological agriculture

Food availability and security is considered to be a major phenomenon of agriculture development in the world since the beginning of mankind. According to FAO, global food security could be in jeopardy, due to mounting pressures on natural resources and to climate change, that threaten the sustainability of food systems at large. Therefore, the production of eco-friendly, cost-effective fertilizers, and their efficient and responsible distribution to provide essential nutrients for crop growth play a vital role in food security.

Course Capsule:

Introduction to ecological agriculture; tropical soil management; introduction to biofertilizers; necessity, scope and challenges; different types of plant growth promoting bacterial and fungal inoculant productions; methods of isolation and culturing of microbes; characteristic attributes of biofertilizers; microbial inoculum scales up production; carrier based biofertilizers; bio-efficacy of biofertilizers; quality control; field application strategies; designing of field trials.

Course ILOs:

At the end of the Short Course in Biofertilizer Technology the students should be able to

- Explain the concepts of biofertilizer use in sustainable agriculture practices
- Evaluate the functions of plant growth promoting rhizo-microorganisms (PGPR) and nutrient management strategies of different crops
- Isolate and characterize symbiotic and non- symbiotic N₂ fixing bacteria
- Isolate and characterize P, K and Zn solubilizing microorganisms
- Elucidate the culturing techniques and commercial bio-formulation of microbes
- Produce biofertilizer microbes in mass scale and their quality control
- Assess the bio-efficacy of different biofertilizer formulations
- Plan the biofertilizer field application strategies

Lesson Sequence

Day	Lesson Title	Number of hours	
		Theory	practical
1	Introduction to ecological agriculture	02	
	Tropical soil management	02	
	Essential nutrients for plant growth and development		01
	Nutrient management strategies for different crops	01	
	Plant growth promoting rhizo-microorganisms (PGPR) and their functions	02	
2	Free living, associative and symbiotic biological nitrogen fixation: mechanisms and requirements	01	
	Legume- <i>Rhizobium</i> symbiosis	02	
	Production technology for free living and associative nitrogen fixers		02
	Production of <i>Rhizobium</i> inoculants for different legume crops		02
	Application of biological nitrogen fixation in sustainable agriculture	01	
3	Production technology of phosphorus solubilizing bacteria and fungi		02
	Production technology of potassium solubilizing bacteria and fungi		02
	Production of microbial consortium of biofertilizers		02
	Formulation of biofertilizers with effective microbial consortia		02
4	Introduction of arbuscular mycorrhizal fungi as biofertilizers	02	
	Arbuscular mycorrhizal fungi inoculum preparation		02
	Formation of bio filmed biofertilizers		02
	Scale up production of microbial consortia		02
5	Testing the efficacy of microbial biofertilizers		02
	Quality testing	01	01
	Designing of field trials		02
	Strategies of the field application	01	01

Assessment Strategy:

Quiz – 1	05 Marks
Assignment -1	10 Marks
Quiz – 2	05 Marks
Assignment -2	10 Marks
Theory paper	20 Marks
Practical	50 Marks
Total	100 Marks

Course Duration

This course shall include approximately **forty (40)** contact hours and will be conducted on 5 days on weekends [Eight (**08**) hrs. per day].

Medium of Instructions

English

Venue

The course will be conducted at the Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka.

Entry Qualifications

Bachelor of Science Degree; Bachelor of Technology from a recognized University/Institution or any other equivalent qualification acceptable to the Faculty Board, Faculty of Applied Sciences.

Major fields: Biology, Agriculture, Applied Biology, Chemistry, Environmental Science, Biosystem Technology, Bioprocess Technology, Food Technology/Science, Natural Resources Management or any other majors approved by the Faculty Board, Faculty of Applied Sciences.

Application Process

Application for registration shall be invited by making public notices web advertisement and flyers. Any person who wishes to apply for the short course shall submit an application on the prescribed form and send it by registered post or online, to the Assistant Registrar, Faculty of Applied Sciences, Rajarata University of Sri Lanka.

Maximum number of the participants for one time: **20**

Selection Procedure

The application received by the Assistant Registrar or Senior Assistant Registrar of the Faculty shall be referred to the Academic Coordinator of the short course. The Head of the Department and the Academic Coordinator having examined the applications for necessary qualifications shall

call the qualified candidates for the short course. The list of candidates selected shall be recommended to the Faculty Board through the Department of Biological Sciences, for its approval.

Registration

On acceptance by the Faculty Board, a person shall be registered as a candidate for the short course in Biofertilizer Technology upon payment of prescribed course fees.

The registration for the Short Course shall deem to have lapsed at the completion of the Course. If a student is unable to attend more than 25% of the academic period due to reasons accepted by the Academic Coordinator, his/her registration for the Course will be extended for a period of completing the next immediate Course in Biofertilizer Technology. Notwithstanding anything stated contrary to these, the University shall have the right to cancel at any time the registration of a candidate.

Suspension of the Course

The Faculty Board reserves the right not to conduct the course subject to refund any fees that may have been received.

Course Fees

Course fee: Rs. 32, 500.00

The course fees shall be decided by the Department of Biological Sciences from time to time as may be deemed necessary by the circumstances.

Course fee may be refundable under the following conditions. But the total course fee is not refundable in any case. If a candidate fails to follow the course after registration, the money paid may be refunded retaining 25% of the total course fee, provided that the candidate has not attended a single study session with valid reason/s.

Enrollment of RUSL Employees

Those employed on the permanent/ temporary/contract basis at the Rajarata University of Sri Lanka, both academic and non-academic staff may be accommodated in the course at a concessionary rate as decided by the Department of Biological Sciences. However, such employees need to submit a service certificate to receive this benefit.

Completion of the Course and Award of Certificates

A candidate shall be awarded with a certificate From Rajarata University of Sri Lanka on successful completion of the course and based on the following conditions.

Paid dues of the course fee as may be payable by her/him to the University.

Been registered as a participant to follow the short course of the Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka for the period required and allowed by the Faculty Board.

Had participated not less than 75% of the total course duration (i.e. from 40 hrs).

Obtained total 50% marks from each evaluation.

Pursued the course in the Department to the satisfaction of the teaching panel and the Faculty Board, Faculty of Applied Sciences, Rajarata University of Sri Lanka.