



SIES

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

AC / 27.06.2023 / RS (1)

College of Arts,
Science &
Commerce (Autonomous)

DEPARTMENT OF BOTANY

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course offered to: FYBA(OE), FYBCOM (OE)

Offered By: Department of Botany

Choice Based Credit System (CBSC) Syllabus Under NEP, 2020

**Approved By Board of Studies in Botany for the
Academic Year 2023 – 24**

OE: BOTANY FYBA & FYBCOM SEMESTER – I (Credits: 4)				
Landscaping and Urban Gardening (2 Theory + 2 Tutorials)				
Paper Code	Unit No.	Unit Name	Credits	Lectures/week
SIUBOOE111	1	Landscaping	02	01+01
	2	Urban Gardening	02	01+01
<p>Course description: Landscaping and urban gardening have become the need of the hour to reduce the carbon footprints and to provide a clean green climate along with the food and financial security to the urban dwellers. Landscaping refers to the art and craft of growing plants to create beauty within the landscape. Urban gardening refers to the cultivation of vegetables, fruits, medicinal and ornamental plants in backyards, balconies, windows, or at rooftops within the urban city limits. The course landscaping and urban gardening would introduce the learners to the scope, role and styles of urban gardening like kitchen gardening, vertical walls, Miyawaki gardening, Nursery management and so on. It would enable the learners to understand the principles of landscaping and appreciate the beauty of classical styles of landscape designing such as English, Japanese, French and Spanish styles of landscaping. Designing professional landscapes using architectural software through computer applications would be the key element of this course. Completion of the course would help the learner to develop required skills for designing landscapes, vertical walls, nurseries, urban gardens and would also encourage them to have their own start-ups or consultancies in the same field.</p>				

OE: BOTANY FYBA & FYBCOM SEMESTER – II (Credits: 4)				
Food Processing Technology (2 Theory + 2 Tutorials)				
Paper Code	Unit No.	Unit Name	Credits	Lectures/week
SIUBOOE121	1	Postharvest Processing and Preservation Technology	02	01+01
	2	Beverage Processing and Preservation Technology	02	01+01
<p>Course Description: Food processing is the important branch of the commercial food industry as it processes the raw fruits, vegetables and flowers to eliminate disease causing micro-organisms and to extend the shelf life of food products. The course Food Processing Technology would help the learners to understand the objectives, scope, and importance of post-harvest preservation technology. It would introduce the learners to various processing and preservation techniques. The course would give them demonstration-based training for processing the fruits and vegetables into jams, jellies, pickles, squash, syrups, fruit leather and so on. The learners would be able to understand the aspects of beverage technology and the basics of natural and alcoholic beverage production along with their health benefits. Completion of the course would help the learner to develop required skills for processing and preserving the fruits and vegetables using different techniques and would also encourage them to have their own small scale start-ups in the same field.</p>				

Semester I		Hr.	Cr.
Paper I - Landscaping and Urban Gardening		60	4
<p>Learning Objectives: The open elective course 'Landscaping and Urban Gardening' in Semester I includes the theory and tutorial-based units on landscaping and urban gardening. It would make the learners understand the overall concept, principles, and scope of outdoor and indoor landscaping. It would develop interest among learners by highlighting the current trends in designing and styling the landscapes and urban gardens. The course aims to introduce the learners to the scope, role, and styles of kitchen gardening, vertical walls, Miyawaki gardening, Nursery management and so on.</p>			
<p>Course Outcomes: After completion of the course, learners would be able to: CO1: Enjoy the beauty of landscapes, urban gardens, topiary gardens, and the plants suitable through field-based studies. CO2: Expertise in designing and styling various types of landscapes, urban gardens, and nurseries. CO3: Apply architectural software for designing professional plantscapes. CO4: Develop required skills to have their own start-ups or consultancies in designing landscapes, vertical walls, topiaries, nurseries, urban gardens. CO6: Get hands-on training for styles of indoor gardening and create their own Bottle-garden, Dish-garden, Bonsai, Hanging Basket, Kokedama.</p>			
UNIT I - Landscaping		30	2
Theory		15	1
1	Landscape gardening: Definition, objective, principles, procedure, scope, and applications. (3L)		
2	Styles of landscape designing: Regular, Naturalistic, Classical styles - English, Japanese, French and Spanish. (6L)		
3	Topiaries & Tree Shaping: Definition, Objectives, Importance, Procedure, Plants suitable. (3L)		
4	Plantscaping: Definition, concept, benefits, key elements, and types - Softscaping, Stonescaping, Waterscaping, Living Green Walls, Floating indoor landscaping, Holyscaping, Microfarming. (3L)		
Tutorials		15	1
1	Landscape Garden plans: Formal, Informal, Private and Public. (2L)		
2	Garden Locations in landscaping and plants suitable: Avenue, Path, Hedge, Edge, Arches and Pergolas, Flower bed, Lawn, water garden and rock garden. (4L)		
3	Computer applications in landscaping (4L)		
4	Topiary Gardens: Kamala Nehru Park, Mumbai, Miracle Garden, Dubai, Durbuy Topiary Park, Belgium, Leven's Hall Manor's Garden, England, Columbus Topiary Park, Ohio, USA. (5L)		

UNIT II – Urban Gardening		30	2
Theory		15	1
1	Introduction to Gardening: Definition, objectives, and scope; role of gardens in horticulture industry. (3L)		
2	Urban Gardening: Definition, significance. Styles of urban gardening and plants suitable - Window gardening, Kitchen gardening, and Miyawaki Gardening. (5L)		
3	Urban Nursery Development and Management: Definition, objectives and scope, Types of nurseries, infrastructure for nursery, capital investments, planning and execution, plant propagation, packaging, sale, exhibition, branding, marketing, transportation, expenditure, and profit analysis. (7L)		
Tutorials		15	1
1	Gardening implements and operations: Types of gardens implements and their applications, Gardening operations - Potting, repotting, irrigation, mulching, composting, fertigation, weeding, pruning, pest, and disease control. (2L)		
2	Propagation of Garden Plants: Sexual and Asexual Propagation methods; Seed Production and Seed Propagation, Vegetative Propagation, Cutting, Budding, Layering and Grafting in Horticultural Plants. (6L)		
3	Urban Indoor Gardening: Bottle-garden, Dish-garden, Bonsai, Hanging Basket, Kokedama (3L)		
4	Small- scale nursery development, management, and economics: Setting up nursery at college level and its management through plant sell and exhibitions. (4L)		

Semester II		Hr.	Cr.
Paper I – Food Processing Technology		60	4
<p>Learning Objectives: The open elective course ‘Food Processing Technology’ in Semester II includes the theory and tutorial-based units on post-harvest processing and preservation technology as well as beverage processing and preservation technology. It would introduce the learners to the world of post-harvest handling, processing and preservation techniques and the governmental schemes available for the same. It would develop interest among learners by highlighting the processing and health benefits of alcoholic, non-alcoholic and probiotic beverages.</p>			
<p>Course Outcomes: After completion of the course, learners would be able to: CO1: Study and comment upon the objective, scope and importance of post-harvest and beverage processing and preservation technologies. CO2: Learn the various post-harvest handling and processing techniques for fruits, vegetables, and flowers for their better shelf-life. CO3: Study and describe Indian Government Schemes available for effective Postharvest management of horticultural crops. CO4: Develop required skills to have their own start-ups by processing fruits and vegetables into jam, jelly, squash, syrup, pickles, mix-herb powders. CO5: Classify and differentiate amongst the alcoholic, non-alcoholic and probiotic beverages along with special reference to their botanical sources, processing techniques and health benefits.</p>			
UNIT I – Post-Harvest Processing and Preservation Technology		30	21
Theory		15	1
1	Introduction to post-harvest technology: Concept, Objectives, Scope, and importance of post-harvest technology in horticultural industry. (3L)		
2	Post-harvest losses: Causes for post-harvest losses (Primary, Secondary), Factors affecting postharvest losses. (2L)		
3	Post-harvest handling operations: Overview of post-harvest handling, Post harvest handling of fruits, vegetables, grains, cut flowers, herbs; Pre-treatment before transport (chlorination, trimming, dressing, waxing, chemical treatment); Packaging and transport of produce; types of storage. (7L)		
4	Indian Governmental Schemes for Postharvest management: Rastriya Krishi Vikas Yojana, Pradhan Mantri Kisan Sampada Yojana, Integrated Scheme for Agricultural Marketing (3L)		
Tutorials		15	
1	Post harvest processing and preservation techniques: Drying (Sun-drying, Hot air drying, Vacuum drying, Osmotic drying), freezing (Cold air blast freezing, Plate Freezing, Cryogenic Freezing, Dehydro-freezing, Freeze-drying), Irradiation. (6L)		
2	Canning of fruits and vegetables (1L)		

3	Processing and preservation of fruits using sugar concentrates: Definition, Principle and preparation of Jam, jelly, fruit candies, and fruit leather. (4L)		
4	Processing and preservation of vegetables using salt concentrates: Definition, Principle of Pickling, Types and preparation of Pickles (Brine, Vinegar, Indian pickles). Preparation of mix herb powder, vegetable powder, vegetable chips. (4L)		
UNIT II – Beverage Processing and Preservation Technology		30	2
Theory		15	1
1	Beverages: Definition, classification/types, nutritional values, and health benefits. Role of Fermentation technology in the Indian Beverage Industry (3L)		
2	Non-alcoholic beverages: Botanical sources, processing and health benefits of Tea, coffee, cocoa, neera, coconut water, kokum juice/sharbat. (3L)		
3	Alcoholic beverages: Botanical sources, and health benefits of Fermented beverage (Wines, Cider, Perry), Brewed and fermented beverages (Beer and Sake), Distilled beverages (Spirits, Liquors and Bitters). (6L)		
4	Preservation of Beverages: Objectives and principles of beverage preservation, Chemical preservatives and their role, Antioxidants, and their role. (3L)		
Tutorials		15	1
1	Industrial preparation of non-fermented beverages: Fruit squash, syrups, and fruit juices. (3L)		
2	Nutritional mocktails: Definition, concept, composition, health benefits. (3L)		
3	Industrial preparation of fermented beverages: Fruit wines, Floral wines, apple cider, fermented red beet juice (3L)		
4	Role of the following in fermentation technology: Bacteria, Yeast, Anthocyanins, fruit, and floral essences (3L)		
5	Preparation of probiotic fermented beverages: Definition, concept, health benefits of probiotic fermented beverages. Probiotic lemonade, Coconut water Kefir, Fermented orange juice (3L)		