

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086.

B.Sc. DEGREE: BRANCH V(A). PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

**General Elective Course offered to Students of
B A. / B.Sc. / B.Com. Degree Programmes**

SYLLABUS

(Effective from the academic year 2015 – 2016)

HERBAL THERAPY

CODE: 15BT/GE/HT22

CREDITS: 2

L T P: 2 0 0

TOTAL HOURS: 26

OBJECTIVE

- To enable students to acquire knowledge of common medicinal plants, with special reference to their availability and therapeutic value

Unit 1 (9 hrs.)

Indian Systems of Medicine

- 1.1 Introduction: Ayurveda, Siddha and Unani
- 1.2 Basic Principles of Ayurveda: Panchamahabhutas, Tridhosha Concept and Malas
- 1.2 Preparation of Ayurvedic and Siddha Medicine
 - Ayurveda: Svarasa (Juice); Churna (Powder); Kalka (Paste); Kashaya (Decoction and Infusion) and Bhasma
 - Siddha: Lavanam, Pashanam, Loham, Rasam and Gandhakam

Unit 2 (8 hrs.)

Herbs and Therapeutics

- 2.1 Herbal remedies for some common ailments: Diarrhoea, Ulcer, Cold, Asthma, Fever, Hypertension, Jaundice, Chickenpox, Diabetes, Menstrual Disorders, Bites and Stings
- 2.1 General Health Tonics and Salads
- 2.3 Preparations of Ayurvedic Medicines: Churnam, Decoction, Leghyam, Tailam and Skin Cream (Practical)

Unit 3 (9 hrs.)

Skin and Hair care

- 3.1 Herbal Care for Facial Skin: Herbal Face Pack for Dry, Oily and Normal Skin
- 3.2 Herbal Remedy for Pimples, Acnes, Black Heads, Corns, Warts and Boils
- 3.3 Herbal Remedy for Dandruff, Premature Greying and Loss of Hair

- 3.4 Hair Washes and Herbal Hair Tonics
- 3.5 Demonstration of Facial and Hair Care

BOOKS FOR REFERENCE

Dastur, J.F. *Medicinal plants of India and Pakistan*. New Delhi: D.B.Taraporewala, 1988.

Duke, J.A. *Handbook on Medicinal Herbs*. London: CRC, 2002

Dananjay J Deshpande., *Handbook of Medicinal Herbs.*, Jodhpur: Agrobios, 2010.

Hans, R.H. *Ayurveda the Gentle Health System*. New Delhi: Motilal Banarsidass, 1994.

Jaibala,S. and G. Balakrishnan. *A Hand Book of Common Remedies Based on Siddha System of Indian Medicine*. St. Louis Institute, 1994.

Judith H.Morrison. *The Book of Ayurveda, A guide to personal wellbeing*. London:Gaia Books, 1994.

Kapoor, L.D. *Handbook of Ayurvedic Medicinal Plants*, India: CRC, 2001.

Prajapati, N.D. and S.S.Purohit. *Agro's Color Atlas of Medicinal Plants*. Jodhpur: Agrobios, 2006

Reddy, K.J, B.Bahadur, B.Bhadriah and M.L.N.Rao. *Advances in Medicinal Plants*, New Delhi: Universities, 2007

Saha, N.N. *Herbal Remedies*. New Delhi: Universal, 1981.

PATTERN OF EVALUATION

No End Semester Examination

Continuous Assessment: 25 Marks

One Component – 25 Marks

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SYLLABUS

(Effective from the academic year 2015–2016)

FRUIT PRESERVATION

CODE: 15BT/GE/FP22

CREDITS: 2

L T P: 2 0 0

TOTAL HOURS: 26

OBJECTIVES

- To enable students to develop skills related to preservation of fruits
- To train students in the preparation and preservation of different fruit products

Unit 1

Introduction

(4 hrs.)

- 1.1 Principles of Fruit Preservation
- 1.2 Types of Spoilage
- 1.3 Factors Promoting Spoilage

Unit 2

Methods and Techniques of Fruit Preservation

(10 hrs.)

- 2.1 Methods: Refrigeration, Freezing, Canning, Dehydration and Chemical Preservatives
- 2.2 Techniques: Proportion of Ingredients, Selection of Fruits, Estimation Tests, Filling and Bottling of Products and Precautions

Unit 3

Preparation of products preserved in sugar and salt

(12 hrs.)

- 3.1 Sugar: Lime Syrup, Grape Crush, Orange Squash, Mixed Fruit Jam, Guava Jelly,
- 3.2 Salt: Tomato Chutney and Mixed Vegetable Pickle

TEXT BOOK

Srilakshmi, B. Food Science, Chennai:New Age International, 2003.

BOOKS FOR REFERENCE

Blank, F.C. *Handbook of Food and Nutrition*. Jodhpur: Agrobios, 2000.

Frazier, W.C. and West Hoff, D.C. *Food Microbiology*. New Delhi: Tata McGraw Hill, 2001.

Kulshrestha, S. K. *Food Preservation*. New Delhi: Vikas, 1994.

Ramakrishnan, S. *Nutritional Biochemistry*. T.R, 1996.

Scenetra, R. *Food Science and Nutrition*. Oxford University, 1997.

Swaminathan, M. *Handbook of Food Science and Experimental Foods*. Bangalore: Bangalore, 1992.

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SYLLABUS

(Effective from the academic year 2015 – 2016)

FUNDAMENTALS OF HORTICULTURE

CODE: 15BT/GE/FH23

CREDITS: 3

L T P: 3 0 0

TOTAL TEACHING HOURS: 39

OBJECTIVES

- To enable students to develop the students to be self-reliant and to develop their entrepreneurial skills
- To enhance practical skills through experiential learning

Unit 1

Introduction

(5 hrs.)

- 1.1 Introduction: Divisions of Horticulture
- 1.2 History of Gardening, Few famous Gardens in India
- 1.3 Types of Gardens: Indoor, Public and Kitchen Garden

Unit 2

Plant Propagation

(10 hrs.)

- 2.1 Pot cultures: Selection of Pots, Potting, Repotting and Potting Mixtures (any two), Demonstration: Potting
- 2.2 Vegetative Propagation: Layering, Cutting, Grafting
- 2.3 Layering, Cutting, Grafting (Demonstration)

Unit 3

Gardening Operations

(5 hrs.)

- 3.1 Planting, Transplanting, Pinching, Disbudding,
Defoliation, Staking, Pruning, Watering, Mulching, and Topiary
- 3.2 Ornamental Garden and its parts

Unit 4 **(11 hrs.)**
Lawn

- 4.1 Lawn and Lawn Making
- 4.2 Rockery
- 4.3 Terrarium: Theory (Practicals)
- 4.4 Bonsai: Theory (Demonstration)

Unit 5 **(8 hrs.)**
Commercial Floriculture

- 5.1 Economic Flowers - Jasmine and Rose
- 5.2 Cut Flowers, Importance and Methods to Prolong Vase Life
- 5.3 Flower Arrangement - Fresh and Dry
- 5.4 Flower Arrangement - Fresh and Dry (Practicals)

TEXT BOOK

Kumar, N. *Introduction to Horticulture*. Nagercoil: Rohini, 1980.

BOOKS FOR REFERENCE

Chauhan, D.V.S. *Vegetable Production in India*. Agra: Ram Prasad, 1968.

Edmund, J.B., T.L.Senn, F.S.Andrews and R.G.Halfacre. *Fundamentals of Horticulture*, (4th Ed.). London: Tata McGraw Hill, 1994.

Acquaah, George. *Horticulture Principles and practices*,(4thEd.). London: PHI, 2009.

Iyengar, Gopalswamy. K.S. *Complete Gardening in India*. Bangalore: Kalyan, 1970.

Janick, J. *Horticultural Science*, (3rd Ed.). New Delhi: Surgeet, 1962

Naik, K.C. *South Indian Fruits and their Culture*. Madras: P.Varadharaj, 1968

Randhawa, G.S. *Ornamental Horticulture in India, Today and Tomorrow*. New Delhi: Indian Council of Agricultural Research, 1980.

Sheela, V. L. *Horticulture*, Chennai: MJP, 2011.

Saini R.S. *Laboratory Manual of Analytical Techniques in Horticulture*. Jodhpur:Agrobios. 2012.

Yawalkar, K.S. *Vegetable Crops of India*. Nagpur: Agri –Horticultural, 1961.

PATTERN OF EVALUATION

No End Semester Examination

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A – 5 x 3 = 15 marks (50 words)

Section B – 3 x 5 = 15 marks (3 out of 4 questions to be answered in 200 words each)

Section C – 1x 20 = 20 marks (1 out of 2 questions to be answered in 1000 words each)

Third Component:

List of evaluation modes:

Water analysis of samples and submission of Results

Quiz

Assignments / Scrap Book

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SYLLABUS

(Effective from the academic year 2015 – 2016)

WASTE MANAGEMENT

CODE: 15BT/GE/WM23

CREDITS: 3

L T P: 3 0 0

TOTAL TEACHING HOURS: 39

OBJECTIVES

- To study management of solid and liquid wastes
- To gain insight to monitoring water quality

Unit 1

(5 hrs.)

Introduction

1.1 Wastes: Solid and Liquid Wastes,

1.2 Waste Generation and Sources - Municipal, Kitchen, Garden,
Agricultural and Industrial

Unit 2

(10 hrs.)

Recycling of Wastes

2.1 Composting - Principles, Process and Factors Affecting Composting.

2.2 Composting - Biodung method (practical)

2.3 Vermiculture Biotechnology: Types of Earthworms, Culturing of
Earthworms, Vermibed Maintenance

2.4 Vermicomposting: Principle and Process

2.5 Types of Vermicomposting - Heap Method and Pit Method: Theory
and Practical

Unit 3 (10 hrs.)

Sewage Disposal

3.1 Primary Treatment

3.2 Secondary Treatment

3.2.1 Aerobic - Septic Tanks, Trickling Filters and Oxidation Pond

3.2.2 Anaerobic - Sludge Digestion

3.2.3 Tertiary Treatment - Chemical, Ozone and Reverse Osmosis

Unit 4 (10 hrs.)

Biomonitoring of Water Quality and Water Purification

4.1 Test for Water Purity - Coliform Test and Membrane Filter Technique

4.2 Testing for Purity of Water - Coliform Test, Physical Analysis of Water - pH, Color, Turbidity, TDS, Chemical Analysis of Water - Salinity, Hardness and Nitrate content (Practical)

4.3 Water Treatment - Steps involved in Water Treatment in typical Water Purification Plant

Unit 5 (4 hrs.)

Transformation of Wastes

5.1 Recycling of Paper

5.2 E-waste

TEXT BOOK

Purohit, S.S. *A Textbook of Environmental Sciences*, Student Edition , 2004.

BOOKS FOR REFERENCE

Gupta, P.K. *Vermicomposting for Sustainable Agriculture*. India: Agrobios. 2004.

Ismail, S.A. *The Earthworm*. Goa: Other India, 2005.

Kumar, H.D. *Environmental Pollution*. M.D, 2004.

NIIR Board. *Modern Technology of Waste Management*, Asia Pacific, 2004.

Rachel, M.A. *Analysis of Waste Water for use in Agriculture*, WHO, 1996.

Sathe, T.V. *Vermiculture and Organic Farming*. Daya, 2004.

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Quiz

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Scrap Book

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SYLLABUS

(Effective from the academic year 2015–2016)

FOOD SCIENCE

CODE: 15BT/GE/FS23

CREDITS: 3

L T P: 3 0 0

TOTAL HOURS: 39

OBJECTIVES

- To enable students gain knowledge and understanding about the nature of food and human nutrition and an appreciation of the importance of food to health
- To facilitate identification of important principles in fermentation

Unit 1

(7 hrs.)

Basic Nutrition

1.1 Introduction

1.2 ICMR Five Food Groups

1.3 Food Pyramid

1.4 Balanced Diet

1.5 Vitamin Deficiency Diseases

Unit 2 (8 hrs.)

Food Processing

- 2.1 Cereals and Legumes
- 2.2 Fruits and Vegetables
- 2.3 Milk and Milk Products
- 2.4 Fish
- 2.5 Eggs

Unit 3 (8 hrs.)

Nutraceutical Values of Health Foods:

- 3.1 Broken Wheat Khicheri
- 3.2 Ragi Dhal Porridge
- 3.3 Sprouted Salad
- 3.4 Spinach Pongal
- 3.5 Banana Carrot Halwa

Unit 4 (8 hrs.)

Traditional Food

- 4.1 Preparation and Nutraceutical Properties of the following Fermented Foods
 - 4.1.1 Milk: Paneer and Curd
 - 4.1.2 Vegetable: Sauerkraut and Pickle
 - 4.1.3 Cereal: Idly and Neer Agaram
 - 4.1.4 Beverage: Grape Wine and Goosberry Wine
 - 4.1.5 Palm Jaggery
- 4.2 Food ways specific to Festivals- Diwali and New Year
- 4.3 Nutritional Requirements during Pregnancy and Infancy
- Practicals: Preparation of few Fermented Foods

Unit 5 (8 hrs.)

Ayurvedic Food

- 5.1 Basic concepts of Vata, Pitta, Kapha and relevance of six Tastes in Food
- 5.2 Diet regimen for Vata, Pitta, Kapha individuals
- 5.3 Importance of Navadaniyam

TEXT BOOK

Srilakshmi, B. Food Science. Chennai: New Age International, 2003.

BOOKS FOR REFERENCE

Bamji Mehtab, S. et al. (ed), *Textbook of Human Nutrition*, New Delhi: Oxford & IBH, 1998.

Chakraverty, A. *Postharvest Technology of Cereals, Pulses and oilseeds*. New Delhi: Oxford

and IBH, 1988.

Dauthy, M.E. *Fruit and Vegetable Processing*. India: International, 1997.

Garrow, J.S. and W.P.T.James, *Human Nutrition and Dietetics*, Churchill Living Stone, 1993.

Rosenthal, I. *Milk and Milk Products*. New York: VCH, 1991.

Srivastava, R.P. and Kumar, S. *Fruit and Vegetable Preservation: Principles and Practices*. Lucknow: International, 1998.

Haard, N.F. and Salunkhe, D.K. *Postharvest Biology and Handling of Fruits and Vegetables*, Westport: AVI, 1975.

JOURNALS

Food Technology.:

International journal of food science and nutrition.

Journal of food science and technology (India)

Indian food industry.

Journal of human nutrition and plant foods.

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FLORICULTURE

CODE: 15BT/GE/FR23

CREDITS: 3

L T P: 3 0 0

TOTAL HOURS: 39

OBJECTIVES

- To introduce students to floriculture and to develop their entrepreneurial skills
- To enhance their practical skills through experimental learning

Unit 1

(7hrs.)

Basics of Floriculture

1.1 Introduction: Aim and scope of Floriculture

1.2 Diversification of Floriculture in India

1.3 Common Garden Operations

1.4 Soil Types

1.5 Manures, Fertilizers, Biofertilizers, Vermicompost and Growth Regulators

Unit 2 (5 hrs.)

Techniques

2.1 Techniques of Growing Plants – Preparation of Ground and Beds, Potting and Repotting; Types of Pots and Hanging Baskets

2.2 Potting and Repotting – Practicals.

2.3 Preparation of Herbal Solutions and Application of Sprays and Dusts to check Pest attack

Unit 3 (5 hrs.)

Vegetative Propagation

3.1 Vegetative Propagation Methods: Cutting, Grafting and Layering

3.2 Vegetative Propagation Methods: Cutting, Grafting and Layering (Practicals)

3.3 Green House-Control of Temperature, Humidity and Light in Covered Structures

Unit 4 (7 hrs.)

Commercial Floriculture I

4.1 Ikebana

4.2 Study of quality parameters for Cut Flowers - for Domestic Markets and for Exports

4.3 Holding of Cut Flowers-Harvesting, Conditioning and Storage of Cut Flowers, Wrapping and Tying Materials, Packing Cartons and Methods to Prolong Vase- Life

4.4 Visit to Commercial Nurseries

Unit 5 (15hrs.)

Commercial Floriculture II

5.1 Commercial uses of Flowers – Jasmines, Chrysanthemums and Crossandra

5.2 Long Stem Cut Flowers - Perennials – Rose, Carnation and Gladiolus, Annuals – Aster, Dianthus and Celosia (Cockscomb), Cut Greens – Ferns, Palms, Cycads and Thuja

5.3 Specific cultural requirements for certain crops (Chrysanthemum, Rose and Carnation) –such as Pinching, Disbudding and Regulation Scheduling/ Forcing of Flowering

1.4. Preparation of Flowers for Display in Flower Shows, Garland, Hair Pieces, Bouquets and Posy

5.5 Flower Arrangement – Fresh and Dry

5.6 Flower Arrangement – Fresh and Dry (Practical)

TEXT BOOK

Sheela, V. L. *Horticulture*, Chennai:MJP, 2011.

BOOKS FOR REFERENCE

Bose. T.R and Yadev, L.P., *Commercial Flowers*. Calcutta: Naya Prakash, 1989.

Bose, T. K., Maiti R.G., Dhua, R.S and Das, F., *Floriculture and Landscaping*, Calcutta: Naya Prakash, 1999.

Gopalswamy Iyengar, K. S., *Complete Gardening in India*. Bangalore Kalyan, 1970.

Lauria, A. and Ries. V.H., *Floriculture, Fundamentals and Practices*. Jodhpur: Agrobios, 2001.

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Assignments / Scrap Book