

SEMESTER - III

Skill Based Subject I - HERBS AND HEALTH

Instructional Hrs. : 45

Sub. Code : 15BOUS301

Max.Marks:CIA-25;ESE- 75

Credits : 3

Objectives: To acquire knowledge of medicinal plants, their medicinal uses and uses of various components of Traditional systems of medicine

UNIT – I

9 Hrs.

Green Revolution and Organic Farming - Introduction- Indian Agriculture before green revolution, advantages of green revolution- *Components of Organic Farming.*

UNIT – II

9 Hrs.

Green Manuring - Definition, Objectives- Classification of green manuring- Agronomy of green manure crops- Methods of application of green manure- *Future needs.*

UNIT – III

9 Hrs.

Indigenous Medicinal Systems of India - Ayurveda – Siddha – Homeopathy – *Unani* - Need to preserve the knowledge of the aforesaid systems.

UNIT – IV

9 Hrs.

Higher plants and their Medicinal Uses - Ocimum sanctum - Emblica officinalis - Aegle marmelos - Vinca rosea - Cissus quadrangularis - Piper betle and *Allium sativum.*

UNIT – V

9 Hrs.

Nutraceutical Fruits & Vegetables - Tomato – Carrot – Beetroot - Soya Bean – Pomegranate - Jamun and *Grapes.*

Note : *Italics* denotes Self Study Topics

TEXT BOOKS:

1. **Panda, H.**, “*Hand Book on Herbal Drugs and its Plant Sources*”, National Institute of Industrial Research, Delhi.
2. **Panda, H.**, “*Complete Technology Book on Herbal Perfumes and Cosmetics*”, National Institute of Industrial Research, Delhi.
3. **Gokhale, S.B, Kokale, C.K,Purohit, A.P.**, *Pharmacognosy* , Nirali Prakashan, Pune.

REFERENCE BOOKS :

1. **Acharya Vipul Rao** . “*Herbs that Heal*, Diamond Pocket Books , New Delhi.
2. **Kokate, C.K, Purohit, A and Gokhale, S.R.**, “*Pharmacognosy*”, Nirali Prakashan, Pune, 43rd Edition, 2009.

SEMESTER-III

Non - Major Elective I - Ornamental Horticulture

Instructional Hrs.: 30

Sub. Code : 15BOUN301

Max. Marks : ESE - 100

Credits : 2

Objectives: To understand the basic aspects of indoor and outdoor gardening. To know different types of ornamental plants and implements used in gardening. To develop the art of miniature plants and soil less culture.

UNIT – I **6 Hrs.**

Horticulture - Importance and scope –history - divisions of Horticulture - garden styles.

UNIT – II **6 Hrs.**

Elements of garden - Living elements – hedges, edges, lawn, arches, pergolas, topiary, trophy – garden adornments – fountains, statues -*Garden implements*.

UNIT – III **6 Hrs.**

Garden Plants - Annuals, biennials, perennials, climbers, special group of garden plants- succulents-and cacti- ornamental palms- bulbous plants- *orchids*.

UNIT – IV **6 Hrs.**

Indoor gardening - Terrarium- Bottle and Dish garden and *Hanging Basket*-Bonsai- Hydroponics- Vegetable and fruit carving.

UNIT – V **6 Hrs.**

Outdoor gardening - Rockery and water garden-*Kitchen garden* –Cut flowers-Flower arrangement – dry – fresh decoration and horticultural shows.

Note :*Italics* denote Self Study Topics

TEXT BOOKS:

1. **Kumar, N.**, "Introduction to Horticulture", Oxford and IBH, Publishing Co. Pvt. Ltd. NewDelhi, 2010
2. **Prasad, S. and Kumar, U.**, "*Principles of Horticulture*", Agro Botanica, India, Revised Edition, 1999.

REFERENCE BOOKS:

1. **George Acquaah.**, "*Horticulture Principles and practices*", Prentice-Hall of India PrivateLtd., 2nd Edition, 1673.
2. **Manibhushan Rao, K.**, "*Textbook of Horticulture*", Macmillan India Ltd., 2000.
3. **Dey, S.C.**, "Complete home gardening", Agrobios 2001.
4. **Chauhan, R. K.**, "Encyclopedia of General gardening for common people", Dominant publications and distributors, 2011.

SEMESTER - IV

CORE PAPER IV - CELL BIOLOGY AND TISSUE CULTURE

Instructional Hrs: 60

Sub. Code: 15BOUC404

Max. Marks: CIA – 25; ESE - 75

Credits: 4

Objectives: To study the structure and functions of Cell organelles. To know the mechanism of Gene expression and Protein synthesis. To know the techniques related to tissue culture.

UNIT – I

12 Hrs.

Cell Organelles - Structure and function of cell wall, Plasma membrane (Fluid mosaic model only) - Endoplasmic reticulum- Mitochondria and *Ribosome*.

UNIT – II

12 Hrs.

Cell Organelles - Chloroplast- Nucleus- Chromosome - *Dictyosomes* (Structure and functions only).

UNIT – III

12 Hrs.

Nucleic acids and Cell division - Structure and Replication of DNA. Structure and types of RNA- Protein synthesis - *Mitosis* and *Meiosis*.

UNIT – IV

12 Hrs.

Tissue culture Techniques - Basic requirements- Sterilization techniques- Media preparation – M.S. Medium. Cellular totipotency- Explants preparation and *Aseptic Manipulation*. Callus culture- Suspension culture- Organogenesis.

UNIT – V

12 Hrs.

Tissue culture Techniques - Protoplast isolation and culture- Meristem culture - Anther culture –*Production of artificial seeds and its application*.

Note: *Italics* denote Self Study Topics

PRACTICALS:

1. Study of mitosis using Onion root
2. Study of cell organelles through slides and photographs
3. Sterilization techniques
4. Preparation of M.S medium.
5. Callus culture

TEXT BOOKS:

1. **Arumugam, N.**, "*Cell Biology*", Saras Publication, Kanyakumari Dt., Revised Edition, 2003.
2. **Verma, P.S. and Agarwal, V.K.**, "*Cytology*", S. Chand & Company Ltd., New Delhi, Revised Edition, 1983.

REFERENCE BOOKS :

1. **Dubey, R.C.**, "*A text book of Biotechnology*", S. Chand & Company Ltd., New Delhi, Revised Edition, 2009.
2. **Kumaresan, V.**, "*Biotechnology*", Saras publication, Nagercoil, Kanyakumari Dt., Revised Edition 2009.
3. **Power, C.B.**, "*Cell biology*", Himalaya Publishing House, Nagpur, Second Edition, 1977.

SEMESTER- IV

Non-Major Elective II - NURSERY AND LANDSCAPING

Instructional Hrs. : 30

Sub.Code : 15BOUN402

Max. Marks : ESE - 100

Credits : 2

Objectives : To acquire the aspects and perspectives on nursery and landscape gardening. To know the different kinds of nursery structures

UNIT – I

6 Hrs.

Nursery preparation - Introduction- scope – components of nursery- growing media for nursery plants - preparation of nursery beds - *Organic manuring*.

UNIT – II

6 Hrs.

Plant growing structures - *Pots and containers* - Nursery structures – Hot bed, Cold Frame, Green house, Lath house, Conservatory, Poly tunnels, Net house – Growth regulators in horticulture.

UNIT – III

6 Hrs.

Methods of Propagation - *Cutting*–*Layering*-Simple,Compound and Air layering-*Grafting*-*Approach grafting* ,*Cleft grafting*, *Bud grafting* (Outline only).

UNIT – IV

6 Hrs.

After care of plants - Transplantation –hardening, Pruning and thinning -Plant protection – disease causing organisms – *control measures*.

UNIT – V

6 Hrs.

Landscaping& designing - *Importance of garden* -landscape gardening- beauty components and principles-designing a garden- trees in landscaping.

Note : *Italics* denote Self Study Topics

TEXT BOOKS :

1. **Kumar, N.** Introduction to Horticulture, Oxford and IBH, Publishing Co. Pvt. Ltd. New Delhi, 2010.
2. **Prasad, S. and Kumar, U.,** “*Principles of Horticulture*”, Agro Botanica, India, Revised Edition, 1999.

REFERENCE BOOKS :

1. **George Acquaah,** “*Horticulture Principles and practices*”, Prentice-Hall of India Private Ltd., 2nd Edition 1973.
2. **Jitendra Singh,** “*Basic Horticulture*”, Kalyani Publishers, New Delhi, Reprint, 2004.
3. **Manibhushan Rao, K.,** “*Textbook of Horticulture*”, Macmillan India Ltd., 2000.
4. **Saini, R.S., Kaushik, N., Kanshik, R.A. and Godara, N.R.** Practical Nursery Production, Agrobios, 2006.