

**Anekant Education of Society's
Tuljaram Chaturchand College of Arts, Science and
Commerce, Baramati
(Autonomous)**

UG Syllabus : w.e.f. 2022-23 to 2024-25

Preamble

The first year B.Sc. syllabus including fundamental as well as advanced concepts in the Botany. After studying the syllabus, students shall inspire for pursuing higher studies in Botany and becoming an entrepreneur. This syllabus can help to understand diversity in plant groups and plant science related industries. The practical course is aimed to equip the students with skills required for plant identification, description, classification and also applications of these plants in various industries.

F. Y. B. Sc. Botany Syllabus (2022-23 to 2024-25)

Class	Sem.	Paper	Title of Paper	Credits
F.Y.B.Sc.	I	USBT111	Diversity of Cryptogams	02
		USBT112	Industrial Botany - I	02
		USBT113	Practical - I	02
	II	USBT121	Diversity of Phanerogams	02
		USBT122	Industrial Botany - II	02
		USBT123	Practical - II	02
S.Y.B.Sc.	III	USBT---	Taxonomy of Angiosperms	03
		USBT---	Plant Physiology	03
		USBT---	Practical - III	02
	IV	USBT---	Anatomy and Embryology	03
		USBT---	Plant Ecology	03
		USBT---	Practical - IV	02
T.Y.B.Sc.	V	USBT---	Cryptogamic Botany (Algae, Fungi, Bryophytes and Pteridophytes)	03
		USBT---	Spermatophyta and Palaeobotany	03
		USBT---	Cell and Molecular Biology	03
		USBT---	Industrial Botany	03
		USBT---	Biostatistics	03
		USBT---	Optional Paper : Botanical Techniques / Horticulture	03
		USBT---	Practical - V	02
		USBT---	Practical - VI	02

		USBT---	Practical - VII	02
	VI	USBT---	Plant Physiology and Biochemistry	03
		USBT---	Plant Biotechnology	03
		USBT---	Genetics and Plant Breeding	03
		USBT---	Plant Pathology	03
		USBT---	Pharmacognosy	03
		USBT---	Optional Paper : Research Methodology / Seed Technology	03
		USBT---	Practical - VIII	02
		USBT---	Practical - IX	02
		USBT---	Project	02

SYLLABUS (CBCS) FOR F. Y. B. Sc. BOTANY

(w.e. from June, 2022)

Academic Year 2022-2023

Class : **F. Y. B. Sc. (Semester - I)**

Paper Code: **USBT111**

Paper : **I**

Title of Paper: **Diversity of Cryptogams**

Credit : **2**

No. of lectures: **36**

A) Learning Objectives:

1. To understand the plant diversity with special reference to cryptogams diversity.
2. To give idea of conservation and economic importance of cryptogams.

B) Learning Outcome:

1. Students will be able to understand cryptogams and to aware about their conservation.
2. Students will get knowledge about the applications of cryptogams.

Credit - I (20 L)

Unit - 1

1.1 **Introduction** : General outline of plant kingdom, introduction to lower cryptogams and higher cryptogams and their scope and importance, awareness and need of conservation (4L).

1.2 **Algae** : Introduction, habitat, thallus diversity, pigments, reserve food and types of reproduction, Life cycle of *Spirogyra*, Economic importance of algae (08L).

Unit - 2

- 2.1 **Fungi** : General characters, thallus structure, mode of nutrition and types of reproduction, pathogenic importance of fungi, Life cycle of *Rhizopus*, Economic importance of fungi (08L).

Credit - II (16 L)

Unit - 3

- 3.1 **Lichens** : General characters, and Types of Lichens on the basis of thallus morphology. Economic importance of lichens (3L).
- 3.2 **Bryophytes** : Occurrence and Salient features, Life cycle of *Riccia*, Economic importance of Bryophytes (7L).
- 3.3 **Pteridophytes** : Occurrence and Salient features, Life cycle of *Equisetum*, Economic importance of Pteridophytes (6L).

References :

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4. Vashista B.R, Sinha A.K and Singh V.P. (2005) : Botany for degree students –Algae, S.Chand's Publication.
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15. Rashid A. (1999) : An Introduction to Pteridophyta. Vikas Publishing House Pvt. Ltd. New Delhi.
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20. Gangulee and Kar (2006) : College Botany. New Central Book Agency.
21. Sundar Rajan S. (1999) : Introduction to Pteridophyta. New Age International Publishers, New Delhi.

Class : **F. Y. B. Sc. (Semester - I)**
 Paper Code : **USBT112**
 Paper : **II** Title of Paper : **Industrial Botany - I**
 Credit : 2 No. of lectures : 36

A) Learning Objectives:

1. To enlist the industrial applications of Botany
2. To provide technical knowledge of floriculture and nursery industries.

B) Learning Outcome:

1. Development of entrepreneurs and inculcate business oriented culture.
2. Students will get knowledge of making value added products.

Credit - I

Unit - 1 (20L)

- 2.1 **Introduction to Industrial Botany:** Concept of Industrial Botany. Plant resources and industries: Food, fodder, fibers, medicines, timber, dyes, gum, tannins. (Two examples of each resource and the relevant industries). **(2L)**
- 2.2 **Floriculture Industry:** Introduction, Scope, Important floricultural crops, Open cultivation practices- harvesting and marketing of Tuberose. Concept of green house, Indoor cultivation practices- harvesting and marketing of *Gerbera*, **(6L)**
- 2.3 **Plant Nursery Industry:** Concept and types of nurseries: ornamentals, fruit plants, medicinal plants, vegetables, orchids, forest nursery, commercial applications. **(6L)**
- 2.4 **Propagation methods:** Seed propagation, natural vegetative propagation and artificial vegetative propagation (Cutting: Stem, Layering: Air layering, Grafting: Stone grafting and Approach grafting, Budding: T-budding). **(6L)**

Credit - II

Unit - 2 (16L)

- 2.1 **Plant Tissue Culture Industry:** Concept, culture techniques: Types of explants, preparation of media, methods of sterilization, inoculation techniques, incubation and hardening. Commercial significance (6L)
- 2.2 **Agri Industries:** Organic Farming: Concept and need, types of organic fertilizers, advantages and limitations. Seed industries: Importance of seed industries, seed production, seed processing and seed marketing with reference to cotton. Major seed industries and corporations of India (6L)
- 2.3 **Post Harvest Technology:** Methods of preservation, preparation of value added products fruit pulp, fruit powder, chips, jam, juice, ketchup. Packaging and marketing (4L)

References:

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5. Debashish Sengupta and Raj Kamal (2009) : Floriculture Marketing in India, , Excel Books.
6. Floriculture Hand Book, Eiri, Engineers India Research in Publication.
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12. The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farming (Ann Larkin Hansen) (2010) : Storey Publications.
13. Hand Book of Mushroom Cultivation, Processing and Packaging (2007) : Engineers India Research In Publishers
14. Paul Stamets (2011) : Growing Gourmet and Medicinal Mushrooms, Ten Speed Press Publishers
15. Amarjit S. Basra (2006) : Handbook of Seed Science And Technology: Seed biology, Production, and Technology, Food Products Press publishers.

Class : **F. Y. B. Sc. (Semester - I)**
Paper Code : **USBT113**
Paper : **III** Title of Paper : **Practical-I**
Credit : **2** No. of Practicals : **11**

A) Learning Objectives :

1. To give knowledge of handling of microscope and identification of cryptogams.
2. To give hands-on training of production of agroproducts.

B) Learning Outcome:

1. Creation of expert technologist and biodiversity conservator.
2. Students can raise the small scale industries like *Spirulina* cultivation, mushroom cultivation, horticulture based applications of mosses, fernery etc.

1. Study of *Spirogyra* 1P
2. Study of *Rhizopus* 1P
3. Study of Lichen diversity 1P
4. Study of *Riccia* 1P
5. Study of *Equisetum* 1P
6. Study of plant resources in industries: food, fodder, fiber, medicine, timber and gum (one example of each). 1P
7. Study of artificial plant propagation: Stem cutting and Air Layering. 1P
8. Study of artificial plant propagation: Approach grafting and T- budding. 1P
9. Demonstration of micropropagation methods. 1P
10. Preparation of Jam and Squash 1P
11. One day botanical excursion to study cryptogam's diversity / Visit of Agrobased Industry (Study / visit report is compulsory). 1P

(Note: Visit mentioned in the practical No. 11 is compulsory. It carries 10 marks at the time of practical examination).