



College of Arts,  
Science &  
Commerce (Autonomous)

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

**SIES College of Arts, Science and Commerce (Autonomous)**

**Sion (West) Mumbai: 400022**

**Affiliated to Mumbai University**

**Syllabus under NEP effective from June 2024 Offered by:**

**Department of Botany**

**Program: S. Y. B.Sc.**

**Course: Botany VSC and SEC**

**Choice-Based Credit System (CBCS) with effect from the  
academic year 2024-25**

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

After completing the graduation (B. Sc.) course in Botany, the learners would be able to:

- **PSO1:** Identify the different groups of plants and gain knowledge about plant biodiversity and its conservation.
- **PSO2:** Learn different techniques, protocols, methodologies during study and apply them in future.
- **PSO3:** Utilize botanical knowledge for problem solving and for taking real time decisions while working with plants.
- **PSO4:** Learn good laboratory practices and acquire research skills required for industrial support services.
- **PSO5:** Inculcate scientific temperament, good reasoning power, technological and analytical skills while designing the experiments.
- **PSO6:** Develop interest in pursuing higher studies in plant sciences and allied fields to develop a better future.
- **PSO7:** Understand the scope, current trends, job prospects and career avenues in Botany.
- **PSO8:** Share social and environmental consciousness with fellow citizens and motivate them towards taking fundamental steps towards environmental conservation.

## **SYBSC SEM III (2Cr.) VSC: Aromatherapy and Herbal Cosmetics**

### **Course Code: SIUBOVS211**

#### **Learning objectives:**

The course entitled 'Aromatherapy and Herbal Cosmetics' will be offered in Semester – III as a vocational skill course with Botany major. It includes practicals based on screening of plants and their oils used in aromatherapy. It would also provide insight into herbal cosmetics concerning parts of the plant used, preparation, and application of herbal cosmetics.

#### **Course outcomes:**

**CO1:** Learn proper techniques for mounting oil glands from various plants to visualize and study their structures under a microscope.

**CO2:** Understand the formulation and manufacturing process of these products and their applications.

**CO3:** Investigate the botanical source of specific essential oils and explore the therapeutic properties and applications of these oils in aromatherapy.

**CO4:** Analyze the results to understand the potential antimicrobial properties of essential oils.

**CO5:** Interpret the results to assess the effectiveness of essential oils against fungal pathogens.

**CO6:** Understand the principles of TLC and its application in the analysis of essential oils.

**CO7:** Explore the properties and benefits of plants used in preparation of herbal cosmetics.

**CO8:** Learn about the role of herbal cosmetics in promoting healthy hair and scalp, also in face and body care.

#### **List of experiments:**

1. Study of antioxidant activity of essential oils.
2. Mounting of oil glands from the rinds of citrus.
3. Preparation of products from herbal essential oils- Herbal hand rub and scented candles.
4. Study of aromatherapeutic oils concerning their botanical source and applications - Peppermint oil, Citrus Oil, Geranium Oil.
5. Study of Clevenger's apparatus to extract the essential oil.
6. Screening of antibacterial activity of essential oils.
7. Screening of antifungal activity of essential oils.
8. Study of TLC of Citronella oil.
9. Study of TLC of Patchouli oil.
10. Study of plants used in face and body care - Manjishtha, Turmeric, Sandalwood, Neem, Aloe.
11. Study of plants used in hair care - Ritha, Shikakai, Amala, Henna, Maka.
12. Preparation of herbal cosmetics for face and body care - Face Mask, Body Scrub (Ubtan), Herbal soaps, Rose water.
13. Preparation of herbal cosmetics for hair care - Hair shampoo, Hair oil, hair dye.

## **References:**

1. Rose, J. (2013). The aromatherapy book: applications and inhalations. North Atlantic Books.
2. Price, S., & Price, L. (Eds.). (2011). Aromatherapy for health professionals E-book. Elsevier Health Sciences.
3. Davis, P. (2011). Aromatherapy An AZ: The most comprehensive guide to aromatherapy ever published. Random House.
4. Miller, L., & Miller, B. (1998). Ayurveda and aromatherapy: the earth essential guide to ancient wisdom and modern healing. Motilal Banarsidass Publ..
5. Worwood, V. A. (2016). The complete book of essential oils and aromatherapy revised and expanded: over 800 natural, nontoxic, and fragrant recipes to create health, beauty, and safe home and work environments. New World Library.
6. PANIGRAHI, D. R., ASANE, G. S., & KHAN, D. M. R. The Textbook of Cosmetic Sciences. JEC PUBLICATION.
- 7.. Kapoor, V. P. (2005). Herbal cosmetics for skin and hair care.

## **SYBSC SEM IV (2Cr.) SEC: Plants in human nutrition**

### **Course code: SIUBOSE221**

#### **Learning objectives:**

The course entitled 'Plants in Human Nutrition' will be offered in Semester – IV as a skill enhancement course with a Botany major. The learners will be able to understand the importance of plants in human nutrition. The learners will also be able to get a comprehensive understanding of the role of plants in human nutrition, as well as the practical skills and knowledge needed to promote and support plant-based nutrition in diverse settings.

#### **Course outcomes:**

- Understand the importance of plants in human nutrition and the role of plant-based diets in disease prevention.
- Identification of key plant-based foods and their nutritional components.
- Exploring cultural and dietary patterns and promoting plant-based nutrition in diverse settings.
- Addressing common misconceptions and challenges with practical applications of plant-based nutrition.
- Developing personalized plant-based nutrition plans and cultivating a lifelong commitment to plant-based nutrition.

#### **List of experiments:**

1. Study of cereals and millets concerning their botanical source and health benefits - Wheat, Rice, Bajra, Ragi, Jowar.
2. Estimation of the carbohydrate content of cereals/millets.
3. Estimation of the calcium and magnesium content of cereals/millets.
4. Study of pulses and legumes concerning their botanical source and health benefits - Moong, Masoor, Pea, Toor, Chana.
5. Estimation of protein content of pulses /legumes.
6. Study of nuts and oil seeds concerning their botanical source and health benefits - Nuts (Groundnut, Almond) and Seeds (Pumpkin, Flax, Sesame).
7. Study of vegetables and fruits concerning their botanical source and health benefits - Spinach, Brinjal, Drumstick, Banana, Pomegranate.
8. Estimation of anthocyanin/antioxidants/phenolics content from vegetables.
9. Estimation of Vitamin C content of Citrus fruit.
10. Preparation of fruit preserves, sauce, and candy.
11. Study of spices and herbs concerning their botanical source and health benefits - Cumin, Cinnamon, Garlic, Coriander, Curry Leaves.
12. Study common herbs and preparation of herbal mix powder - Rosemary, Thyme, Basil, Oregano, Parsley.
13. Preparation of dry vegetables/ vegetable powder.

**References:**

1. Harrison, S. G., Masfield, G. B., Wallis, M., & Nicholson, B. E. (1969). The Oxford Book of Food Plants. The Oxford Book of Food Plants.
2. Vaughan, J., & Geissler, C. (2009). The new Oxford book of food plants. OUP Oxford.
3. Van Wyk, B. E. (2022). Food plants of the world: identification, culinary uses, and nutritional value (p. 20220212409).
4. Simopoulos, A. P., & Gopalan, C. (Eds.). (2003). Plants in human health and nutrition policy (Vol. 91). Karger Medical and Scientific Publishers.
5. Small, E. (2009). Top 100 food plants. NRC Research Press.
6. Smith Jr, J. P. (2017). Food Plants: A Bibliography.

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