

B.SC. BOTANY

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	25UBOVAC1	Value Added Course - I	30	-	-	100	100
Course Title							
HERBAL TECHNOLOGY							

Syllabus		
Unit	Contents	Hours
I	Herbal Medicines: History and scope. Traditional and alternative system of medicines: Ayurveda, Unani, Siddha, Homeopathy, Chinese system, Kampoh system and Naturopathy. Classification of crude herbal drugs (Alpha, Morphological, Taxonomical, Chemical and Pharmacological)	6
II	Collection and Processing of Crude Drug: National Medicinal Plants Boards advisory guidelines for cultivation of medicinal and aromatic plants – Collection – Harvesting – Drying (Natural and Artificial), Garbling, Packing, Storage and Preservation of herbal drugs. Organized and unorganized crude drugs – Barks, Gums, Mucilage, Dried juices, Lattices and Extracts.	6
III	Extraction of Herbal Drugs: Maceration, Infusion, Percolation, Decoction, Soxhlet extraction, Microwave assisted extraction (MAE), Super critical fluid extraction (SFE), Ultrasound assisted extraction, Enzyme assisted extraction.	6
IV	Analytical Techniques: Evaluation of plant drug – Morphological, Microscopical, Phytochemical and Biological methods. Clinical and modern approaches of herbal drugs. Quality control of herbal drugs.	6
V	Herbal Products Preparation: Evaluation of Excipients of Natural Origins - Tragacanth, Acacia, Starch and Honey. Herbal product preparation - Turmeric cream, Aloe cream, Aloe gel, Orange syrup, herbal lotion and Methi - Shikakai Shampoo. Classical knowledge of herbal drugs. Role of Indian Government in herbal Research & Marketing - CIMAP, AYUSH & TAMPCOL. Commercial herbal products in marketing - Stevia, Himalayan and Vicco products.	6

Laboratory activities:	
1.	To perform preliminary phytochemical screening of crude drugs.
2.	Evaluation of excipients of natural origin.
3.	Incorporation of prepared and standardized extract in cosmetic formulations like creams, lotions and shampoos and their evaluation.
4.	Preparation and evaluation of Turmeric Cream, Orange Syrup B.P.C., Churna Mixture and Tablets.
5.	Soxhlet extraction of phyto-constituents from plants.

Reference Book:
1. Kokata, C. K. (2003). Practical Pharmacognocny. Vallabh Prakashan, Pune.
Web Resources:
1. AYUSH (www.indianmedicine.nic.in). About the systems-An overview of Ayurveda.

Course Outcomes	
Upon successful completion of this course, the student will be able to:	
CO No.	CO Statement
CO1	Define and describe the principle of cultivation of herbal products.
CO2	List of the major herbs, their botanical name and chemical constituents.
CO3	Evaluate the drug adulteration through the biological testing.
CO4	Formulate the value-added processing / storage / quality control for the better use of herbal.
CO5	Develop the skills for cultivation of plants and their value added processing / storage / quality control.

COURSE COORDINATOR: DR. R. SYED MOIDEEN

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
V	25UBOVAC2	Value Added Course - II	30	-	-	100	100
Course Title Biofarming of Spirulina Cultivation for Entrepreneurship							

SYLLABUS		
Unit	Contents	Hours
I	Introduction - Importance, Habit and Habitat. Morphology of spirulina. Biochemical composition - Proteins, vitamins, minerals, antioxidants, pigments (phycocyanin, chlorophyll, carotenoids). Fatty acids and polysaccharides. Global and regional demand for spirulina products.	6
II	Benefits of spirulina – human health and immune system enhancement, Food safety aspects related to human consumption. Spirulina for livestock feed and environmental applications – carbon sequestration.	6
III	Cultivation of spirulina – Culture media – Organic and inorganic cultivation practice. Mass cultivation practices of seedway and raceway pond. Automation and monitoring of spirulina cultivation. Factors influencing spirulina cultivation.	6
IV	Harvesting technology – Prefiltering, washing and cleaning of spirulina. Drying methods of spirulina, pulverizing and packaging, long term and short term storage process of spirulina.	6
V	Value Addition and Product Development – Importance and benefits of value addition in spirulina products, spirulina supplements – food, beverages and cosmetics. Quality control and standards – FSSAI (Licensing & Marketing). Government subsidy schemes. Business strategies and start-up opportunities for spirulina.	6

Laboratory activities:

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| 1. | Cultivation of spirulina. |
| 2. | Preparation of value added products |

Reference Book:

1. Avigad Vonshak, 1997. *Spirulina platensis (Arthrospira)* Physiology, cell-biology and biotechnology, Taylor & Francis Ltd.
2. Habib M.A.B., Parvin M., Huntington T.C and Hasan M.R. 2008. A review on culture, production and use of Spirulina as food for humans and feeds for domestic animals and fish. FAO Fishers and Aquaculture Circular No. 1034, FAO, Rome, Italy.
3. Gershwin M. E., Amha Belay, 2008. Spirulina in Human Nutrition and Health. United Kingdom: Taylor & Francis Ltd.
4. Amos Richmond, Emeritus and Qiang Hu, 2013. Handbook of Microalgal Culture: Applied Phycology and Biotechnology, John Wiley & Sons, Ltd.
5. Selvendran D. 2015. Large Scale Algal Biomass (Spirulina) Production in India. In: D. Das (Ed.) Algal Biorefinery: An Integrated Approach, Springer.

Course Outcomes	
Upon successful completion of this course, the student will be able to:	
CO No.	CO Statement
CO1	Summarize the characteristic features, Identify the morphology, organization of Spirulina.
CO2	Discover various benefits of spirulina for human, livestock and environment.
CO3	Develop and protected commercial production of spirulina.
CO4	Standardize and practices for production, preparation, and packaging of the spirulina.
CO5	Explain the personal finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.

COURSE COORDINATOR: DR. K. MOHAMED RAFI

M.SC. BOTANY

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25PBOVAC1	Value Added Course - I	30	-	-	100	100
Course Title	Indigenous Knowledge System for Plant Resource Conservation and Utilization						

Syllabus		
Unit	Contents	Hours
I	Introduction: Fundamentals of Indian knowledge in plant science, Important tribals of India, Ethnobotany and its types - ethnoecology, ethnomedicobotany, ethnoagriculture, ethnoveterinary and ethnography. Ethnobotanical databases.	6
II	Ethnopharmacology: Indian system of Medicine (IKS): Siddha, Ayurveda, Naturopathy, Unani and Folk medicine – methods, administration and dosages. Tribal healers - <i>Ottamoolis</i> . Medicinal properties of Traditional foods.	6
III	Farm Practices: Land reclamation, natural forming, importance of traditional crop varieties, natural selection, weed and pest control measures, post harvesting and preservation methods. Indigenous layer farming. Community seed banks of India, National Bureau of Plant Genetic Resources (NBPGR) and Dr. K. Ramiah gene bank, Tamil Nadu Agriculture University (TNAU).	6
IV	Conservation: Sacred Groves – Definition, importance, Global and Indian context, Sthala Vrikshas, palace gardens and <i>onfarm</i> conservation of crops, Non Timber Forest Products (NTFP) and Indigenous economics. Indigenous forest management practices and climate change.	6
V	Scientific Documentation and Protection: Indigenous Knowledge and International Initiatives - Indigenous knowledge and World Intellectual Property Rights Organization (WIPO), Convention of Biological Diversity (CBD) & Food and Agriculture Organization (FAO). Indian Initiatives: Traditional Knowledge Digital Library (TKDL), National Innovation Foundation (NIF), Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS) Bhopal, Protection of Traditional Knowledge Act, 2022. Biological Diversity Act 2002 & Biological Diversity (Amendment) Act, 2023. Protection of Plant Varieties and Farmers Rights Authority (PPV & FRA).	6

Laboratory activities:

- Develop the Questionnaire for Documentation of Indigenous knowledge
 - Folk medicine
 - Plant varieties
 - Agricultural Practices
 - Nutraceuticals
- Develop People Biodiversity register of the Village
- Document South Indian Tribes and ethnobotanical utilization of plants (Based on literature survey)
- Traditional Paddy Seed Varieties identification- Demonstration
- Identify the medicinal properties of given food- South Indian meals, North Indian Thali.

Text Book(s):	
1. A.K. Jain Indian Ethnobotany: Emerging Trends, Scientific Publishers India 2. Pullalah, T., Krishnamurthy, K.V. and Bahadur, B. (2017). Ethnobotany of India. Vol. 5. ISBN: 9781315186627. 3. R.L.Banki <i>et al.</i> , 1998. Applied ethnobotany, 1998. The Art Press, Bangladesh.	
Web Resources:	
1. Centre for Indian Knowledge Systems (CIKS) :2nd edition of “Traditional Rice Varieties of Tamilnadu – A Compendium” (TAMIL), launched Honorary D.Litt for Dr. AV Balasubramanian CIKS Receives a Grant from Woka Foundation, USA https://ciks.org/our-publications/rice-ebooks/Traditional Knowledge and its Role in Biodiversity Conservation . https://krishisanskriti.org/vol_image/07_Aug202210081806%20%202039-42.pdf (accessed on 08/2/2025). 2. Ethnobotany https://www.upcollege.ac.in/Upload/econtent/135.pdf (accessed on 27/2/2025). 3. Tribal Healing Practices https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000825CR/001532/M018431/ET/1483519747Text.pdf (accessed on 27/2/2025). 4. Indigenous Knowledge Definitions, Concepts and Applications https://chm.cbd.int/api/v2013/documents/4A27922D-31BC-EEFF-7940-DB40D6DB706B/attachments/209070/Hoda%20Yacoub%20-%20IK%20Report%20(1).pdf .	

Course Outcomes	
Upon successful completion of this course, the student will be able to	
CO. No	CO Statement
CO1	Develop knowledge on Indigenous Indian knowledge in plant sciences
CO2	Appraise the Indian System of Medicine and their usefulness
CO3	Analyse and interpret the indigenous farm practices
CO4	Apply the Indigenous knowledge system in the current Indian context
CO5	Evaluate indigenous knowledge system through the scientific documentation and identify the various protection measures

COURSE COORDINATOR: DR. B. BALAGURU