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# 401b : MUSHROOM CULTURE

**Course Objectives**

1. To study methods of growing edible mushrooms and isolation of Mushroom culture and Culture maintenance.
2. To study basic mushroom substrate preparation, composting and study spawn generation techniques, inoculation methods.
3. To study method of harvesting of Mushrooms.
4. To study diseases and pests of mushrooms; disease and pest management of mushrooms.

**UNIT – I**

History of Mushroom, cultivation, mushroom status in Andhra Pradesh and other states of India; Biology and Ecology of mushrooms; Wild mushroom collection.

**UNIT – II**

Introduction to mushrooms, morphology, classification, edible mushrooms and poisonous mushrooms. Life cycle of *Valverellia* sp., *Pleauritus* sp., *Agaricus* sp., *Calocybe* sp. and *Leutinus* sp.

**UNIT – III**

Spawn preparation : Facilities required for spawn preparation, Preparation of spawn substrate; Preparation of pure culture, culture maintenance, storage of spawn.

**UNIT – IV**

Mushroom Cultivation – Conditions of mushroom cultivation, isolation, spawn production, growth media, spawn running, harvesting and storage of mushrooms. Medical and nutritional value of mushrooms. Mushrooms diseases and management.

**Course Outcomes**

1. An ability to know types of edible and poisonous mushrooms.
2. An ability to know method of cultivation of mushrooms.
3. An ability to have self employment.
4. Able to prepare Organic fertilizers and apply it to field level.

## Skill Development Course
## BOT-401A : HYDROPONICS

**Course Objectives**

1. Basic knowledge on Hydroponic systems ; aware on Hydroponic materials (media, etc.)
2. Working with Hydroponic equipments.
3. Basic knowledge on Nutrition management.
4. Hydroponic greenhouse management; basic knowledge on Hydroponic crops.

**UNIT I**

**Introduction to Soilless culture of plants:** History and origin of Soilless culture, Present status of hydroponics-Contrasts with soil-based culture, Applications & Future developments

**UNIT II**

**Plant Nutrition:** Essential, mineral elements-Functions and effects on plants, Deficienc Symptoms of the following Essential Minerals-N, P , Ca, Mg, K, S, Fe , Mn, Cu, Zn , B ,Mo Environmental & Chemical Factors: Light (quality, ener, Photoperiodism & systems) Temperature (heating & cooling), Humidity and $CO_2$., pH, PPM/TDS.

**UNIT III**

**Nutrient Solutions and Media:** Inorganic salts (fertilizers)-Macronutrients, Micronutrient Formulating, monitoring, and analyzing, Plant Nutrition, pH adjustment, selecting fertilize and nutrient monitoring; Media used for Hydroponics: Ex-clay, Rock wool, Coir, Perlit Pumice, Vermiculite, Sand, Gravel, Brick shards, Polystyrene packing peanuts, wood fibe Weed management, diseases and pest control, Pollination, making clones of plants.

**UNIT IV**

**Techniques in Hydroponics and Cultivation of crop plants:** Techniques in Hydroponics Static solution culture, Continuous – flow Solution culture, Aeroponics, Passive sub-irrigatio Ebb and flow or flood and drain irrigation, Deep water culture; Protocols for – Toma cultivation through Dutch bucket method, Chilly cultivation through NFT system, Spina through Raft system , Fodder system.

**Course Outcomes**

1. Describe the advantages/disadvantages of controlled environment agriculture and hydroponic crop production in the agricultural production of various food crops.
2. Demonstrate an understanding of basic principles of plant biology, entomology, plant nutrition and disorders, irrigation and fertilization, and environmental