**Savitribai Phule Pune University**

**Akole Taluka Education Society**

**Agasti Arts, Commerce and Dadasaheb Rupwate Science College,**

 **Akole, Dist-A’Nagar**

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**Department of Wine Technology**

**Format for PSO and CO for academic year 2020-21**

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| Name of Faculty | Science & Technology |
| Name of Department | Wine Technology |
| UG Programme | B.Sc. Wine Tech. |

**Programme Specific Outcome [C.O]:-**

1: Understand the importance of wine, their types and its quality.

2: Achieve   knowledge of wine making.

3: Understand contribution of wine in increase and improve our Health, Quality and production

 Methods

4: Understand marketing strategies of growers and wine makers.

5: Understand knowledge of wine tech. is an essential pre-requisite for the pursuit of many applie

 Sciences like Alcohol tech., brewery, biochemistry, botany and Microbiology.

6: Understand current scenario in wine and wine making.

7: Understand experiments in wine technology.

8: Fundamentals, principles& practical skills and recent development in subject area.

9: Inspire and boost interest of student towards the wine technology as a main stream &

 Understand global market

10: Create foundation for advance studies, research & development in wine & vine.

**S.Y.B.Sc. [Beer, Wine and Alcohol Technology] Semester-III**

**CBCS- PATTERN -2020-2021**

 **WT - 301: Yeast Culture Technology – I**

**-** Understand the Importance of yeast strains in wine making.

- Maintenance of yeast strains and preservation of it, Yeast culture techniques.

- Learn the Normal micro flora and pathogens of grapevine.

- To know Types of microbial spoilage of wine, Prevention of microbial spoilage

 Curing and storage of wine.

**WT-302-Fermentation Technology -I**

-To study about fermentation process and various types of ferment.

-The learner will acquired the knowledge of various parts of ferment.

-To study about the manufacturing process of Fermenter.

-To learn about various utilities required for fermentation.

**WT – 303: Brewing Technology – I**

 - To understand the different Beer Styles

- Learn the Origins of Style, Methods Used to Define Brewers Association’s

 Beer Style Guidelines.

- To knowOutline of the Brewing Steps (Malts, Adjuncts ,brewing liquor, milling, mashing, Wort separation, Wort boiling, Trub removal, Wort cooling*/*aeration , Yeast handling, Yeast pitching, Fermentation , Yeast removal, Aging, Clarification, Packaging , Warehousing and distribution)

- To understand the barley (Structure and function: the husk the pericarp, testa, Aleurone Layer, Starchy Endosperm, The Embryo)

-Learn the Malt Production (Drying, Storage, and Handling, steeping, Germination, Kilning and Malt Quality, Malt varieties)

**WT-304 Alcohol Technology – I**

-Study the Role of wine technologist in distillery (Scope & functions of technical person in

 In distillery)

-Learn the Raw materials used in alcohol production (Sugar containing; starch

 Containing and cellulosic raw materials.)

-Study the Stoichometry

-Understand the Beverage alcohol products-Pot and continuous distillate products for

 Making maturation & white sprits

**WT-305-Biochemistry-III**

-Study the general methods of extraction & purification of metabolites.

-Learn the different techniques of Centrifugation, Crystallization, ion exchange, Electro dialysis &

 Solvent extraction.

-Study the Phenolic compounds present in wine.

-Understand the process of Malolactic fermentation & its role in wine making process

**WT – 306: Vineyard Technology – I**

- To understand the study of soil and its function, Physical and Chemical properties of soil.

- Learn the Principles of weathering of rocks and materials.

- To knowStudy of vineyard establishment, Relationship of grapevine and climatic factors.

- To understand Selections of grape (wine grapes) varieties for plantation, Method of plantation.

-Learn the Care of young vine, Weed control.

- To understand Definition and concept of canopy, Canopy microclimate, Training and pruning

 Practices.

**WT 309: Practical’s course –I**

**-**To Study the of effectiveness of hand washing.

-To understand the preparation of Nutrient media and Morphological identification of yeast

-To know the reparation of Nutrient media and Morphological identification of LAB & AAB

-To learn determination of cell density of given microorganism by Turbidiometry method

- To Study Isolation of yeast from infected grape or must and its identification.

- To learn Determination of aptitude of yeast to form hydrogen sulphide

- To Study Determination of sensitivity of yeast to antibiotic streptomycin.

- To understand Effect of variable pH on yeast growth.

-To determine the thermal death rate of the given organism (TDR).

- To know the Determination of thermal death time of the given organism (TDT).

-To study the effect of U.V radiations on Microbial growth

-To learn the Case study-culture preservation methods.

- To know the Bacterial motility by swimming growth method.

**WT 310: Practical’s course –II**

- To know the technique of collecting and preserving representative sample of soil

- To understand the particle size of the soil sample.

- To know the water holding capacity of the given soil sample

- To learn the temperature and pH of the soil sample

- To know the conductivity of the soil sample by using specific apparatus

- To understand calcium and magnesium contents of the given soil sample

- To know the Phosphorus and Nitrogen in the given soil sample

- To study the alkalinity, Chlorides and Sulphates contents in the soil sample

- To study grape varieties suitable for propagation in a favorable climatic conditions

- To study method of plantation, irrigation and supply of nutrients for the grape plants

- To observe and study the morphology of weeds occur in vine yard

- To know the training and pruning techniques in vineyard for canopy management

- To understand and observe nutrient deficiency in grape plant

- Field visit to nearby Vine Yard and submission of a report

**WT 311: Practical’s course –III**

- To understand the Determination of total, fixed and volatile acidity rectified sprit.

- To learn the Fusel oil determination in sprit sample.

- To conduct potassium permanganate test for finding the quality of spirit

- To know the Determination alcohol content of given spirit by hydrometer method

- To understand the Determination alcohol content of given spirit by specific gravity method.

- To learn the Reduction and blending of sprit

- To observe the Sampling & grading of barley

- To understand the Estimation of protein content of barley by suitable method

- To determine the Brix, specific gravity of the molasses.

- To know the pH of the molasses and wort

- To determine the reducing sugars in the given molasses sample

- To understand the Microscopic observation of alcoholic fermented wash

- To know Estimation of residual sugar in molasses fermented broth

- To understand the Estimation of alcohol content in molasses fermented broth

- To know the Estimation of volatile acids in molasses fermented broth

- Visit to brewery or distillery and submission of the report

**S.Y.B.Sc. [Beer, Wine and Alcohol Technology] Semester-IV**

**CBCS- PATTERN -2020-2021**

**WT-401 Yeast technology paper-II**

**-** To understand the Preparation of yeast starter cultures, contamination of yeast, growth of yeast.

- To know Role of yeast in grape flavor development, transformation of Aromatic substances.

- Learn the Significance of yeast and bacterial enzymes.

- Controlling degree of anaerobiosis, Killer factors in fermentation.

**WT-402 Fermentation technology paper-II**

**-**To understand the Types of Inoculum

-To know the Media Formulation, Media Optimization

-To understand the Media Sterilization principles

-To learn the Process parameters and their importance

-To know the Products of fermentation**,** Oriental fermented foods, the microbial production of

 Organic acids, the microbial production of amino acids, Fruit based alcoholic beverages.

**WT-403 Wine technology –I**

- Understand theRed wine – objectives**,** red wine varieties and styles, making of rose style wines.

- To know red wine making process, differentiate it from white wine making.

- To learn evaluation of a number of Australian red wine styles,Red wine making process.

- Learn the Bottling- maturation in bottle.

- To understand theInfluence of climate, temperature, humidity& seasonal fluctuations.

- To know managing wine grape garden under aberrant climate conditions.

**WT-404 Wine technology –II**

**-** To learn the Production of white wine, White Wine objective, Varieties and style.

- To understand the physiology of grape: Component, principal, location, fate.

-To know White wine making process, Harvesting, crushing, pressing, juice, addition of active yeast

- Control of fermentation parameter, Clarification and stabilization, Maturation and aging.

- Understand the Blending, bottle aging and post bulk operation.

- To knowCooperage for wine making**,** oak barrel making in world.

- To learn Racking: role and technique, Theory of protein fining, fining teachings, and products used

 In Fining, Clarification treatment.

**WT-405 Waste treatment paper-I**

**-**To understand theFermentation industry waste, Wastewater composition, characterization studies

- Learn thePhysical Unit Operations, Flow measurement, Screening.

- To know Accelerated gravity separation, Flotation, Granular medium filtration.

- Understand theChemical Unit Processes, Chemical precipitation, Disinfection, Dechlorination.

-To learn theBiological Unit Processes**:** Aerobic, Anaerobic, Denitrification, and Biosorption.

**WT-406 Vineyard technology paper-II**

**-** To learn the Production of white wine, White Wine objective, Varieties and style.

- To understand the physiology of grape, Component, principal, location, fate.

-To know White wine making process, Harvesting, crushing, pressing, juice, addition of active yeast

- Control of fermentation parameter, Clarification and stabilization, Maturation and aging.

- Understand the Blending, bottle aging and post bulk operation.

- To knowCooperage for wine making**,** oak barrel making in world.

- To learn Racking: role and technique, Theory of protein fining, Fining teachings, and products used

 in Fining, Clarification treatment.

**WT 409: Practical’s course -I**

**-** To learn the Evaluation of alcohol as skin detergent

**-** To understand the Visualization of yeast by vital staining.

- To know Inoculums development of yeast and determination of exponential phase of growth

- To learn Microscopic observation of yeast during all stages of wine production

**-** To learn the Determination of viable count of yeast from fermenting wine sample by Neubars

 Chamber

- To understand the Preparation of slide culture method

- To know Study of normal flora of grape berry and leaf.

- To learn Measurement of growth of wine yeast (Direct cell count)

-To study the effect of alcohol concentration on yeast growth

-To know Log sheet of fermentation and its graphical representation

- To learn Isolation of bacteria (E.Coli) from wastewater, Perform confirmed test for coliform

 Bacteria & biochemical identification by IMViC test

- To know the Fermentation waste and their utilization for the production of value added product

- To understand the Determination of ability to produce acetic acid by yeast strain.

 -To understand the Checking efficiency of disinfectant with phenol coefficient technique

**WT 410: Practical’s course –II**

-To learn the techniques of Stem cuttings and its propagation

-To learn the technique of “Whip” grafting for propagation of grape plants

-To learn the “tongue” grafting for propagation of grape plant

-To know the technique of “T” budding for propagation of grape plant

-To study and observe the anatomy of the stem of grape plant

-To study the morphology, anatomy and microscopic features of a matured berry of grape

-To study and learn harvesting techniques of matured grape fruits

-To study the morphological and anatomical structure of infected part of Powdery mildew of grape

 Leaf.

-To study the morphological and anatomical structure of infected part of Downey

-To study the morphological and anatomical structure of infected part of Anthrancnose of grape leaf

-To observe and study the different disorders like pink berry, water berry, short berry, of grape fruits

-To study and observe nutrient deficiency symptoms of Nitrogen, Phosphorus and Magnesium in

 Grape plants.

-To study different equipment and implements used in Vineyard

-To study the morphological characters of wine verities of grape berries

-A field visit to nearby winery and submission of the report

**WT 411: Practical’s course –III**

-To study the Determination of pH of juice (grape or any fruit)

-To know the Determine the total acidity of juice (grape or any fruit)

-To Study the total soluble solids of grape juice/wine/must by refractometry

-To Study the total soluble solids of grape juice/wine/must by hydrometry

-To understand the Determination of pH of wine red wine & white wine

-To learn the Determination of sulphur-di-oxide by ripper method.

-To know the Determination of reducing sugar by Lane and Eynon method

-To understand the Innovative idea or concept in wine production world: A case study

-To Study the Determination of volatile acidity, fixed acidity and tiratable acidity in wine

-To know the Conduct heat stability test for protein stability in wine

-To learn the Alcohol estimation in wine

-To Study the Sensory evaluation of sparkling wines

-To study the Sensory evaluation of dessert wines

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