



VASANTDADA SUGAR INSTITUTE

Manjari (Bk), Pune- 412307, Maharashtra

Department of Alcohol Technology and Biofuels

Program : M.Sc. Wine, Brewing and Alcohol Technology

Program Code : M.Sc. WBAT

Program Duration : 2 Years

Program outcomes

This programme intends to balance the theoretical knowledge with practical learning skills with an objective to excel students for careers in beverage and spirit industry.	
1.	PO-1: Knowledge: Students will be exposed to a wide range of topics in beverage & spirit production with intensive training in laboratory related work.
2.	PO-2: Problem Analysis: Students will be able to enhance skills through classroom teaching, laboratory work, project and internship using sophisticated instruments and analyse results with literature comparison.
3.	PO-3: Designing Solutions: Students will be trained to develop the processes & products that can meet specific needs of beverage & spirit industry.
4.	PO-4: Modern tool usage: Students will be trained to apply appropriate techniques, resources and tools in the analysis and synthesis of data with an understanding of the limitations.
5.	PO-5: Communication Development: Students will be able to communicate effectively on scientific issues with the scientific community and society in the form of documentation & presentations.
6.	PO-6: Employability: Students will be trained for suitable employment in beverage and spirit industries through internship and on-campus interview.
7.	PO-7: Ethics: Students will be able to apply ethical principles and commit professional ethics which have impact on social, economic and environmental issues.
8.	PO-8: Environment and Sustainability: Students will be able to understand the environmental issues and apply their knowledge for sustainable solutions through research projects.





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9.	PO-09: Science and Society: Students will be encouraged to apply logical reasoning based on the knowledge, skills, designing solutions for the evaluation of issues linked to society, health & safety.
10.	PO-10: Life-long learning: Students will be able to recognize the need for the preparation and have the ability to engage in independent and life-long learning in every broad context of technological opportunities & challenges.





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Course Outcomes

Semester I

Class	Course Code and Name	Outcome	Level
M.Sc. I	WT 1.1 Viticulture	After completion of this course students are able to-	
		CO1: Understand the physical & chemical properties of soil for grape cultivation	L1
		CO2: Summarize the grapevine propagation techniques	L2
		CO3: Illustrate the vineyard establishment techniques	L3
		CO4: Classify the grape pest	L4
		CO5: Evaluate the harvesting practices and post-harvest processes of grapes	L5
M.Sc. I	WT 1.2 Microbiology of Alcohol, Beer & Wine	After completion of this course students are able to-	
		CO1: Describe the isolation techniques of microbes	L1
		CO2: Understand the effect of various parameters on growth and their measurement	L2
		CO3: Evaluate and compare the growth rates of microbes	L3
		CO4: Evaluate the stoichiometry of alcohol fermentation and different fermentation production techniques	L4
		CO5: Select the suitable raw material for the fermentation production techniques	L5
M.Sc. I	WT 1.3. Biochemistry of Alcohol, Beer & Wine	After completion of this course students are able to-	
		CO1: Describe the cell organelles in living cells	L1
		CO2: Understand the pathways and role of enzymes involved in alcoholic fermentation	L2
		CO3: Illustrate structure and function of biomolecules	L3
		CO4: Classify different types of biomolecules	L4
		CO5: Evaluate the correlation between genes and biomolecule	L5
M.Sc. I	WT 1.4 Practical Course I	Based on microbiology and biochemistry	
		After completion of this course students are able to-	
		CO1: Study basic techniques in microbiology laboratory	L1
		CO2: Understand the isolation and enumeration of microorganisms by different techniques	L2





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		CO3:	Preparer culture media for identification of yeast	L3
		CO4:	Analyze physical parameters of distillery-based samples	L4
		CO5:	Evaluate different techniques of staining	L5
M.Sc. I	WT 1.5 Fermentation Technology	After completion of this course students are able to-		
		CO1:	Understand the basic concept of fermentation	L1
		CO2:	Differentiate between growth and production medium	L2
		CO3:	Determine the criteria for selection of raw material for fermentation	L3
		CO4:	Outline the different operational modes of fermentation	L4
		CO5:	Compare different types of fermenters	L5
M.Sc. I	WT 1.6 Practical Course II	Based on Fermentation Technology		
		After completion of this course students are able to-		
		CO1:	Study physical parameters of different soil sample and study of infected leaves of grapevine	L1
		CO2:	Understand anatomical features and observe pest attack on grapevine	L2
		CO3:	Determine of particle size holding capacity, different parameters like pH, Particle size and organic matter of soil sample	L3
		CO4:	Analyze in-organic composition based on chlorides and sulphates of the soil sample	L4
CO5:	Evaluate total alkalinity of the soil sample by titration method	L5		





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Semester II

Class	Course Name	Outcome	Level
M.Sc. I	WT 2.1 Alcohol Technology- I	After completion of this course students are able to-	
		CO1: Define methodology for yeast propagation	L1
		CO2: Explain the different feedstock for alcohol production	L2
		CO3: Determine the alcoholometry by British & USA units.	L3
		CO4: Illustrate of alcohol chemical & physical properties	L4
		CO5: Compare the batch and continuous fermentation process	L5
M. Sc I	WT 2.2 Brewing Technology- I	After completion of this course students are able to-	
		CO1: Know the raw material of brewing process	L1
		CO2: Describe the prototypes of malting	L2
		CO3: Illustrate hop product with respective to raw material chemistry and adjuncts	L3
		CO4: Classify different beer types	L4
		CO5: Evaluate beer style on the basis of their raw material	L5
M. Sc I	WT 2.3 Enology-I	After completion of this course students are able to-	
		CO1: Describe history and classification of wine	L1
		CO2: Understand major constituents of grape juice and wine	L2
		CO3: Illustrate wine making processes	L3
		CO4: Categorize wine based on nutritional basis	L4
		CO5: Evaluate biochemistry of alcoholic fermentation	L5
M. Sc I	WT 2.4 Practical Course I	Based on Alcohol, Brewing and Enology	
		After completion of this course students are able to-	
		CO1: Describe sampling & grading of barley & grapes	L1
		CO2: Understand germination process of barley	L2
		CO3: Determine physical and compositional parameters of in spirit	L3
		CO4: Categorize raw material based on different Indian and International standard methods	L4
CO5: Evaluate different varieties of grapes for	L5		





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		preparation wine		
M. Sc I	WT 2.5 Chemical and Plant Engineering- I	After completion of this course students are able to-		
		CO1:	Define basic terms related to process instrumentation	L1
		CO2:	Understand the fundamental concept of heat transfer	L2
		CO3:	Illustrate the vapor - liquid equilibrium for various mixtures	L3
		CO4:	Categorize different process instruments	L4
		CO5:	Evaluate key terms associated with process instrumentation	L5
M. Sc. I	WT 2.6 Practical Course II	Based on Chemical and plant engineering After completion of this course students are able to-		
		CO1:	Tabulate characteristics of steam distillation	L1
		CO2:	Understand the working principle of hydrometer, refractometer and specific gravity bottle	L2
		CO3:	Apply measurement techniques to identify properties of must, wort, and molasses samples	L3
		CO4:	Analyze wine samples for contamination	L4
		CO5:	Evaluate calibration of process instruments	L5





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Semester III

Class	Course Name	Outcome	Level
M. Sc. II	WT 3.1 Alcohol Technology- II	After completion of this course students are able to-	
		CO1: Define the maturation and aging of county and foreign liquor	L1
		CO2: Describe the rectified spirit, extra neutral alcohol and anhydrous alcohol	L2
		CO3: Illustrate the Indian & International standards of molasses and various alcohol	L3
		CO4: Categorize the manufacturing process of extra neutral alcohol and anhydrous alcohol	L4
		CO5: Compare the atmospheric and multipressure distillation	L5
M. Sc. II	WT 3.2 Brewing Technology II	After completion of this course students are able to	
		CO1: Define the level of packaging	L1
		CO2: Describe the waste generation in beer making process	L2
		CO3: Demonstrate the process of beer making	L3
		CO4: Illustrate the factors affecting beer quality	L4
		CO5: Compare beer styles based on production techniques	L5
M. Sc. II	WT 3.3 Enology-II	After completion of this course students are able to-	
		CO1: Define wine fortification	L1
		CO2: Understand role of various microbes in enology	L2
		CO3: Determine constituents of grape juice and wine	L3
		CO4: Illustrate development of wine parks	L4
		CO5: Evaluate quality of wine by sensory analysis	L5
M. Sc. II	WT 3.4 Practical Course I	Based on alcohol, brewing and wine technology	
		After completion of this course students are able to-	
		CO1: Study properties of Wine, Indian-made foreign liquor, Spirits	L1
		CO2: Understand basic concepts of Indian-made foreign liquor, spirit	L2
		CO3: Determine chemical parameters of Indian-made foreign liquor, spirit	L3
		CO4: Illustrate methods of wine making from raw	L4





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		material other than grapes	
		CO5: Assess wine sensory analysis parameters	L5
M. Sc. II	WT 3.5 Marketing of alcoholic beverages	After completion of this course students are able to-	
		CO1: Describe wine marketing principles	L1
		CO2: Understand basic wine marketing terminologies	L2
		CO3: Examine consumer behaviour and marketing strategies	L3
		CO4: Categorize marketing opportunities	L4
		CO5: Summarize financial management	L5
M. Sc. II	WT 3.6 Practical Course II	Based on marketing of alcoholic beverages	
		After completion of this course students are able to	
		CO1: Identify advertising and promotion management aspects	L1
		CO2: Understand bottle labelling and packaging	L2
		CO3: Demonstrate e-commerce design and digital marketing	L3
		CO4: Illustrate industrial analysis report	L4
		CO5: Develop brand and label for alcoholic beverages	L5





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Semester IV

Class	Course Name	Outcome	Level
M. Sc. II	WT 4.1 Industrial Waste Treatment	After completion of this course students are able to-	
		CO1: Define the waste disposal norms and regulation for winery and brewery	L1
		CO2: Understand waste water treatment techniques	L2
		CO3: Use of water conservation techniques in distillery	L3
		CO4: Categorize the waste water stream for process use	L4
		CO5: Compare the various polluted and non-polluted waste in distillery	L5
M. Sc. II	WT 4.2 Business Management	After completion of this course students are able to-	
		CO1: Describe the concept of marketing environment	L1
		CO2: Understand operational business management	L2
		CO3: Illustrate the financial management	L3
		CO4: Outline on marketing management and buying behaviour	L4
		CO5: Summarize the importance and function of marketing Management	L5
M. Sc. II	WT 4.3 Chemical and Plant Engineering- II	After completion of this course students are able to-	
		CO1: Describe the concept of separation techniques	L1
		CO2: Understand the different types of heat exchange equipments with their applications	L2
		CO3: Determine the number of plates in distillation system based on vapor liquid equilibrium	L3
		CO4: Illustrate the pumps and their applications	L4
		CO5: Evaluate the concepts of industrial instrumentation and automation	L5
M. Sc. II	WT 4.4 Project/ In Plant Training	After completion of this course students are able to-	
		CO1: Identify and model problems linked to the industry	L1
		CO2: Develop technical, inter personal and communication skill	L2
		CO3: Apply theoretical aspects in practical situations by accomplishing the tasks with respect to social, cultural, global and	L3





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			environmental responsibility	
		CO4:	Analyze the challenges and future potential of outcomes with respect to industrial issues	L4
		CO5:	Evaluate the training experience in terms of their personal, educational and career perspective	L5
M. Sc. II	WT 4.5.1 Alcohol Technology- III	After completion of this course students are able to-		
		CO1:	Describe various types of continuous fermentation process	L1
		CO2:	Describe method of alcohol analysis	L2
		CO3:	Illustrate process of alcoholic beverages and their sensory analysis	L3
		CO4:	Outline process of alcohol production from non-molasses sources	L4
		CO5:	Evaluate quality aspects of alcohol using MPR distillation	L5
M. Sc. II	WT 4.5.2 Practical	Based on Alcohol Technology		
		After completion of this course students are able to-		
		CO1:	Identify properties of molasses	L1
		CO2:	Understand properties of molasses fermented broth	L2
		CO3:	Determine reducing sugars in molasses	L3
		CO4:	Estimate alcohol content in molasses fermented broth	L4
M. Sc. II	WT 4.6.1 Brewing Technology- III	After completion of this course students are able to-		
		CO1:	Describe contamination control method in beer making process	L1
		CO2:	Explain beer stability	L2
		CO3:	Illustrate different packaging methods of beer	L3
		CO4:	Outline entire beer making process from aging to finishing	L4
		CO5:	Compare home brewing and micro brewing	L5
M. Sc. II	WT 4.6.2 Practical	Based on Brewing Technology		
		After completion of this course students are able to-		
		CO1:	Describe raw material and beer product parameters	L1
		CO2:	Understand culture media requirement for	L2





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			isolation of bacteria from beer		
		CO3:	Determine physical parameters of raw material and product in beer production	L3	
		CO4:	Analyze sugar and alcohol content of beer	L4	
		CO5:	Evaluate compositional analysis method for raw material of beer production	L5	
M. Sc. II	WT 4.7.1 Enology -III	After completion of this course students are able to-			
		CO1:	Describe clarification & stability of wine	L1	
		CO2:	Understand maturation and ageing of wine	L2	
		CO3:	Illustrate the concept of blending and bottling	L3	
		CO4:	Select suitable practical technique to solve wine defects	L4	
		CO5:	Evaluate wine quality on the basis of maturation and ageing	L5	
M. Sc. II	WT 4.7.2 Practical	Based on Enology			
		After completion of this course students are able to-			
		CO1:	Identify new techniques in wine production	L1	
		CO2:	Understand pre-operations of wine bottling	L2	
		CO3:	Demonstrate filtration and bottling of wine	L3	
		CO4:	Assess wine based on fining agents	L4	
CO5:	Evaluate quality control aspects of packaging materials	L5			

*(BT Levels: L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analyzing, L5 - Evaluating and L6 - Creating)


Principal



Principal
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