



**GOVERNMENT OF TAMILNADU  
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI**

**STATE PROJECT COORDINATION UNIT  
(Established under Canada India Institutional Cooperation Project)**

**CURRICULUM**

Course Name	Production of Hand Sanitizer
Course Code	CHE/2020/002
Course Duration	60 Hours
Minimum Eligibility Criteria and Pre-requisites(if any)	10th Std & above
Course Objectives	<p>Training module has been designed to provide the participants</p> <ul style="list-style-type: none"> <li>• Better Knowledge of Production and Quality - Ease of Work</li> <li>• Minimize Human Errors in production of Hand Sanitizer - Greater Accuracy and Consistency</li> <li>• Reliability - Improve Efficiency and consistency of production of Hand Sanitizer</li> <li>• Reduce the Cost of Production</li> <li>• Good Working Environment</li> </ul>
Course Outcomes	<p>At the end of training, the participants will be able to learn</p> <ul style="list-style-type: none"> <li>• The better quality of Hand Sanitizer Production</li> <li>• Production of Hand Sanitizer in a greater accuracy and consistency due to reduced errors</li> <li>• Increased efficiency by following the SOP</li> <li>• Capacity to perform multiple roles like financial accountant, cost accountant, audit assistant, etc.</li> <li>• Reduction in Production costs via., optimizing the Breakeven Point in Process condition and Energy utilization</li> <li>• Lower operating costs due to reduced need for human resources and stationery</li> <li>• Better knowledge of production and process safety</li> </ul>
Expected Job Roles	Process Technician, Production Supervisor and production manager, Entrepreneur

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
CHE/2020/002	Production of Hand Sanitizer	Theory	15	10	20	3 Hours
		Practical	45	40	80	
		Total	60	50	100	

**CHE/2020/002- PRODUCTION OF HAND SANITIZER****DETAILED SYLLABUS**

Unit No.	Modules	No.of Hours	
		Theory	Practical
I	Production of Hand Sanitizer and its basic concepts	20 Hours	
1.1	Introduction to Production of Hand Sanitizer and its basic concepts	5	15
1.2	Raw material - identification, Selection of cheap and commercially available materials such as Turmeric, Sandal, Tulsi, Neem, alcohol etc.,		
1.3	Selection of Process and suitable solvent, and Importance of hand sanitizer		
II	Raw Materials Purification steps	20 Hours	
2.1	Identification of materials (such as Turmeric, Sandal, Tulsi, Neem, Garlic etc.,) – Properties like size, shape, moisture content, colour, odour etc.,	5	15
2.2	Purification Steps – Deskinning, Washing with running water, Powdering, screening , mixing with proper proportion		
2.3	Solvent – Selection of solvents, solvent purity, viscosity, odour, colour of the solvent, and some ingredients : isopropyl alcohol, aloe vera gel, an essential oil such as tea tree oil or use lemon juice instead		
III	Hand Sanitizer Production and Packaging	20 Hours	
3.1	Types of Process - Extraction of herb components from plant leafs, skin and stem of the various plants, Grinding and performing ethanolic extraction , cold pressing techniques, Preparation of formulation for a batch size mixing	5	15
3.2	Characteristics, uses and benefits of Hand sanitizer, types of sanitizers – Chlorine based sanitizer, Quaternary Ammonia concentration, Iodine concentration sanitizer		
3.3	Hand Sanitizer packaging and marketing dynamics – Filling, Labeling, Quality Check, and Packing.		
Total Theory and Practical Hours		15	45
Total Hours		60	

## HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS/EQUIPMENTS
1.	Magnetic Stirrer
2.	Burrete
3.	Measuring Jar

## REFERENCE WEBSITE / BOOKS

1. Aiello, A. E.; Larson, E. L.; Levy, S. B.; et al. (2007). "Consumer antibacterial soaps: effective or just risky?" (PDF). Clin Infect Dis. 45: S137–47. doi:10.1086/519255. PMID 17683018.
2. ^ Löffler, Harald; Günter Kampf (2008). "Hand disinfection: How irritant are alcohols?". Journal of Hospital Infection. 70: 44–8. doi:10.1016/S0195-6701(08)60010-9. PMID 18994681.
3. ^ Pedersen, L.K.; E. Held; J.D. Johansen; T. Agner (2005). "Less skin irritation from alcohol-based disinfectant than from detergent used for hand disinfection". British Journal of Dermatology. 153 (6): 1142–1146. doi:10.1111/j.1365-2133.2005.06875.x. PMID 16307649. S2CID 46265931.
4. ^ Wagner, Daniel S. (2000). "GENERAL GUIDE TO CHEMICAL CLEANING PRODUCT REGULATION" (PDF). International Sanitary Supply Association, Inc. Archived from the original (PDF) on 31 December 2009.
5. ^ Judith E. Foulke (May 1994). "Decoding the Cosmetic Label". FDA Consumer Magazine.

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnic.

## END EXAMINATION ALLOCATION OF MARKS

S.No	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a) Aim	5
	b) Procedure	15
	c) Observation /Calculation	15
	d) Experiment handling	15
	e) Result	10
	f) Record Note	20
<b>Total Marks</b>		<b>100</b>

## THEORY MODEL QUESTION PAPER

### CHE/2020/002- PRODUCTION OF HAND SANITIZER

(Maximum Marks: 20)

(N.B: Answer any Twenty questions)

20x1= 20 Marks

1. What is hand sanitizer?
2. Name any two types of hand sanitizer.
3. Write any two herbal plants for the production of hand sanitizer.
4. Write any two raw materials used to produce hand sanitizer
5. Write any two methods to produce hand sanitizer
6. What are the importance of hand sanitizer
7. Give the advantages of herbal sanitizer.
8. What are the process steps involved in herbal sanitizer production
9. Name any two purification process involved in herbal sanitizer production
10. What is deskinning?
11. What is screening?
12. Write any two Operations in herbal sanitizer production
13. Write any two Chemical properties of herbal sanitizer.
14. Name of the materials used to herbal sanitizer production
15. Write any two types of mixing technique
16. What are the packing materials used in herbal sanitizer?
17. What are the special ingredients to be added to the herbal sanitizer production?
18. Write any two parts of mixing units.
19. What is chlorine based sanitizer?
20. Write any two physical properties of herbal sanitizer.
21. Write any two advantages of herbal sanitizer.
22. Note down any two comparison of herbal sanitizer with other commercial sanitizer.
23. Write any two chemical properties of herbal sanitizer
24. List out the various tests for the Identification of quality herbal sanitizer.
25. Write down the two industrial application of herbal sanitizer.