

Syllabus for the trade
Of

FRUIT & VEGETABLE PROCESSER

(SEMESTER PATTERN)

UNDER
CRAFTSMAN TRAINING SCHEME

Designed in: 2013

By
Government of India
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Directorate General of Employment & Training
Ministry of Labour & Employment
EN - 81, SECTOR - V, SALT LAKE CITY Kolkata
- 700 091

List of members of trade committee meeting for the trade of Fruit and Vegetable Processor held at Dehradun.

S.No.	Name S h r i / S m t .	Designation	Address
1.	Deepankar Mallick	Director, Chairman	ATI-Kanpur
2.	Anil kumar	Joint Director of Training.	ATI-EPI Dehradun
3.	Magan Bhandari	F&B Manager	Hotel Great value, Rajpur Road , Dehradun
4.	H.S. Nigam	V.I.	ATI-kanpur
5.	R.C.Pandey	Principal	Government Institute of Hotel Management and Nutrient,Dehradun
6.	Uday chamyall	Lecturer	Institute of Hotel Management, Dehradun
7.	Ashok Devi Trivedi	Dy. Director	RVTI Allahabad.
8.	Usha Devi Mishra	7.0.(D.M)	RVTI Allahabad
9.	V.S. Kaintura	Manager	Jeet Restaurant, Mussoorie
10.	S.K. Suri	Manager	New India Tourist Centre,Dehradun
11.	Rajendra Singh	Manager Catering	Ramanand Residency, Mussoorie
12.	Pankaj Thapliyal	G.M.	Country Inn, Mussoorie
13.	P.K.Shrma	Personal manager	Jay Pee Residency, Mussoorie
14.	Neeraj Aggrawl	Director	Ram Institute of hotel Management, Dehradun
15.	Amol Aswal	Principal	New taj Institute of Hotel Management, Dehradun
16.	Shubender Rohilla	Hotler	Ramanand Residency, Mussoorie
17.	G.R.Uniyal	Proprietor	Uniyal Bakers
18.	Sachin kumar	Instructor Catering &Hospitality	RVTI, Allahabad.
19.	Sanjay	Catering in charge	Taj Institute of Hotel Management Dehradun
20.	Saty Bir Singh	Administrative Officer	Lal Bahadur Shastri National Academy Mussoorie
21.	V.P.S.Negi	H.O.D.	Kukreja Institute of Hotel Management Dehradun
22.	Vivek Kumar	Assistant lecturer	Institute of Hotel Management, Dehradun

23.	C.S. Negi	A.G.M.	GMVN, Dehradun
24.	Sanjiv kumar	Principal	ITI Gujrala, Dehradun
25.	P.S. Negi	Head of catering	Kukreja Institute of Hotel
26.	A.K. Singh	Joint. Director	Tourism Development Board Uttaranchal, Dehradun
27.	Capt. Yogesh Uniyal	Manager.	Uniyal Bakers and manufacturers.
28.	Neena Sharma	Director	Synergy consultant, Dehradun
29.	Ravindra Mohan Kala	State Secretary, Scout & Guide	55-Rajpur road, Dehradun
30.	Tanuj Nayyar	Senior Sa's Chef.	Jay Pee Residency, Manore-Mussoorie.
31.	P. N.Yadav	Dy. Director.	ATI Kanpur

List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6th to 14th May'2013 at CSTARI, Kolkata.

Sl. No.	Name & Designation	Organisation	Remarks
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata-91	Chairman
2.	K. L. Kuli, Joint Director of Training	CSTARI, Kolkata-91	Member
3.	K. Srinivasa Rao, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Mukherjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, Assistant Director of Trg./Principal	RVTI, Kolkata-91	Member
11.	Venketesh. Ch. , Principal	Govt. ITI, Dollygunj, Andaman & Nicobar Island	Member
12.	A.K. Ghate, Training Officer	ATI, Mumbai	Member
13.	V.B. Zumbre, Training Officer	ATI, Mumbai	Member
14.	P.M. Radhakrishna pillai, Training Officer	CTI, Chennai-32	Member
15.	A.Jayaraman, Training officer	CTI Chennai-32,	Member
16.	S. Bandyopadhyay, Training Officer	ATI, Kanpur	Member
17.	Suriya Kumari .K , Training Officer	RVTI, Kolkata-91	Member
18.	R.K. Bhattacharyya, Training Officer	RVTI, Trivandrum	Member
19.	Vijay Kumar, Training Officer	ATI, Ludhiana	Member
20.	Anil Kumar, Training Officer	ATI, Ludhiana	Member
21.	Sunil M.K. Training Officer	ATI, Kolkata	Member
22.	Devender, Training Officer	ATI, Kolkata	Member
23.	R. N. Manna, Training Officer	CSTARI, Kolkata-91	Member
24.	Mrs. S. Das, Training Officer	CSTARI, Kolkata-91	Member
25.	Jyoti Balwani, Training Officer	RVTI, Kolkata-91	Member
26.	Pragna H. Ravat, Training Officer	RVTI, Kolkata-91	Member
27.	Sarbojit Neogi, Vocational Instructor	RVTI, Kolkata-91	Member
28.	Nilotpal Saha, Vocational Instructor	I.T.I., Berhampore, Murshidabad, (W.B.)	Member
29.	Vijay Kumar, Data Entry Operator	RVTI, Kolkata-91	Member

GENERAL INFORMATION

- 1) **Name of the Trade:** Fruit and Vegetable Processor
- 2) **NCO Code No.** 775.90
- 3) **Duration :** One year (Two semesters)
- 4) **Power Norms :** 4.7 Kw
- 5) **Space Norm :** 64 Sq. mt.
- 6) **Entry Qualification:** Passed 10th Class Examination
- 7) **Unit Size(No. of students):** 16
- 8) **Instructor's/Trainer's Qualification :** (i) National Trade Certificate in Preservation of Fruits & Vegetables trade with three years Experience.

OR

(ii) Diploma in Food Technology or Post Harvest Management with two years Experience

OR

(iii) Degree in Food Technology or Post Harvest Management with one year Experience
- 9) **Desirable Qualification** : Preference will be given to Craft Instructor's Certificate (CIC)

Note: At least one instructor must have Degree/Diploma in particular trade

Syllabus For The Trade Of 'Fruit and Vegetable Processor ' Under C.T.S

Duration:- Six Months

First Semester

Semester Code:PFV: SEM I

Week	Practical	Theory
1-2.	General methods of preservation salt, sugar, oil, spices etc. Knowledge of General Safety, Occupational health and hygiene.	Introduction — Definition and scope of preservation, Historical development of food processing and preservation Industries. General principles and methods of food preservation.
3 - 4.	Preparation . of preserves, candies, crystallized and glanced.	Fruits and vegetables as available in different parts of the country, their preservation, season of maturity, fermentation) purification, causes and control. .
5-6.	Study of common food processing equipment such as sealers, juice extracting machines, autoclaves, corking machines etc.	Selection of raw materials including fruits and vegetables for Preparation of various products, preserving media, mode of action in preservation. Spices and other constituents, their properties, condiments and other additives and ingredients, and their flavoring and preservative properties.
7-8.	Study and use of common instruments such as refract meter, Hydrometers, jelmeter, thermometer, vacuum gauge, pressure gauge, seam checking gauge common balance etc.	Study of various precautions, usage. types of equipments care
9 - 10.	Preparation of tomato products such as juices, puree, sauces, ketchups,	Tomato products : Importance of tomatoes
11-13.	Preparation of tomato products such as juices, puree, sauces, ketchups,	Food grades and standards F.P.O., 1.5.1., Agmark P.F.A. etc.
14-16.	Preparation of common fruit beverages available in the region such as squashes, crushes, cordial, cocktails syrups nectars, R.T.S. beverages etc. Preparation of fruit toffees, cheese and fruit bars. Estimation of Benzoic acid in terms of ppm present in fruits and vegetable products.	Fruit beverages dilution ratio of nectar etc.
17 - 18.	Preparation of james, jellies marmalades etc.	Jams, Jellies and marmalades selection, preparation, regulations in production and preservation.
19.	Estimation of reducing and non	Definition of preserves, candied fruits, glanced

	reducing sugars in fruit vegetable products.	fruits, crystallized fruits- simple methods of preparation of these.
20.	Practical demonstration of sealing pouching machine.	Study of various types of containers-merits and demerits of each-scope for new types of containers/ packaging materials, such as plastic pouches, aseptic brick packs, tetra pack, cartons etc.
21.	Various methods of drying as sun drying, oven drying etc.	Sun drying & dehydration — merits and demerits- Principles involved preservation by drying method.
22.	Various methods of drying as sun drying, oven drying etc	Constituents of food, importance of fruits & Vegetables in the diet.
23.	Study of compound Microscope. Identification of Bacteria, Yeast and mould under microscope. Preparation and transfer of culture media. Preparation of slides and use of simple strains.	Different types Of spoilages in fresh fruits and vegetables and their control by low temperature, freezing and cold storage. Spoilage in persevered foods, their causes and control..
24.	Simple methods of storage using fridge deep freezer etc.	Storage of fresh fruits and vegetables (general aspect.)

25. Project work / Industrial Visit (optional)

26. Revision and Test

Syllabus For The Trade Of Fruit and Vegetable Processor Under C.T.S**Duration:- Six Months****Second Semester****Semester Code:PFV: SEM II****Week No.****Practical Theory**

1.	Study of seal technology, Adjustment and sealing of double seamer.	History and development of food preservation industry with special reference to India.
2-3 .	Preparation of standard solution of salts acids and alkalies used in food industries.	Storage of fresh fruits and vegetable, Containers- Materials used in fruits and vegetable preservation.
4-5.	Canning of commercially important fruits and vegetables.	Canning and bottling- Canning of fruits and vegetables- principles, procedure and steps involved- care in handling of common available fruits and vegetables in the region.
6.	Visit to canning industry	Scheme and layout of canning industry in India.
7-8.	Canning of Meat, Fish and Poultry Products.	A general outline of canning and preservation of animal products Meat, Fish and Poultry.
9.	Identification of different lacquers, defective cans, precautions while consuming the canned foods.	Canning, procedure, sweets, curried, Rasgollas. For Indian dishes and Vegetables hubesand
10.	Estimation of sodium chloride quantitatively and qualitatively in food products.	Pickles, chutneys and sauces, types methods of preparation curing techniques, defects and remedies.
11.	Common methods for storing perishables.	Methods of storing of perishables, surface coating controlled atmosphere atmospto^ etc.
12.	Estimation of sodium chloride quantitatively and qualitatively in food products.	Definition Of Acids, Alkalis and salts, their properties etc.
13 - 14.	Preparation of vinegars, synthetic vinegars.	Study of Vinegars such of cider, grape & served Malt etc.
15-16.	Microbial Examination of canned foods.	Importance of personal Hygiene, Sanitary standards in Fruits and Vegetable preservation.
17-18	Preservation of fruits and vegetable by radiation, principles and method	. Definition of Preservatives-typesof preservatives commonly used in food industry limitations of use of preservatives

19-20	Food additives- Use in fruit and vegetable preservation.	Chemical Preservation — Preservation of foods by use of sugar, salt, chemicals and antibiotics and by smoking.
21-22	Preparation of syrups, carbonated beverages, etc.	Fruit beverage — squashes concentrate, fruit juice powder.
23- 24	Fermentation of fruit juices	Fermented beverages-Fermentation-Champagne Port, Muskat, Tokay, Sherry, Cider Orange wine, Berry. wine, Grape wine.
25	Revision	
26	Examination	

TRADE: Fruit and Vegetable Processor

LIST OF TOOLS & EQUIPMENT

A. TRAINEES TOOL KIT FOR 16 + ONE TRAINEES

Sl.no.	Name of the item	Qty
1-	Vacuum Gauge	01 no
2-	Pressure Gauge	01 no
3-	Seam. Checking gauge or screw gauge	01 no
4-	Refracto-meters (Pocket) 0.32.28-62,58-920 B Sugar Scale	02 nos
5-	Brinometer (Salincimeter)	02 nos
6-	Hydrometers of different ranges 0-30, 30-60, 60-90, Brixhydrometer	01 nos
7-	PH Meter	01 no
8-	Working table with 6-3x21/2 Aluminum tops	2+2 nos
9-	Fruit Trays	6+2 nos
10-	Enamel mugs	8 nos
11-	Enamel bowls	8 nos
12-	Pulper Electric 1/4 Tonne capacity per 8 hrs with 1 HP Motor and two S.S: Seines (1/16 mesh. 1/32 mesh)	01 no
13-	Thermometer 360°C	06 nos
14-	Pressure Cooker	02 nos
15-	Sealing Machine for A 10, A 2 ¹ / ₂ type cans & pouches	01 no
16-	Vegetable grader	01 no
17-	Sandashi (Tongs)	01 no
18-	Perforated spoons S.S.12 ^{nl} length 4 " dia	06 nos
19-	Slicing Machine	01 no
20-	Coring knives	06 nos
21-	Pitting knives	06 nos
22-	Cutting knives	06 nos
23-	Juice Extractor (Screw type) 1 HP motor	01 no
24-	Lime Juice Extractor & orange juice halving & Burring	01 no
25-	Bottle filling machine-Electrically operated with 1 HP motor	01 no
26-	Crown corking machine hand operated one.	01 no
27-	Pilfer proof capping machine	01 no
28-	Weighing balance (digital)'	03 nos
29-	Stainless steel knives	6 pcs +16 pcs
30-	Spoons of assortedsize	16 pcs
31-	Stainless steel degdhes	6 pcs
32-	Gan and cork open&	
33-	Jelemeters	6 nos
34-	Jelly Filter bags	4 nos
35-	Kilburn dehydro meter 12 trya capacity with blower & heating coils	01 no

36-	Glass Funnels of assorted sizes	12 nos
37-	Enamelled trays of assorted size	16 nos
38-	Enamelled buckets or stainless buckets	06 nos
39-	Gas burner with cylinder.	06 nos
40	Aluminium container 50 gallon capacity	2+2 nos
41-	2 Industrial burner hurne,iwith	2 Cylinder
42-	4 Double burners With	2 Cylinder
43-	Electric Mixer	1 no
44-	Spoons, Wooden Ladls	16 nos
45-	Cooking range electric	01 no
46-	Rubber Gloves	12 pair for each trainee
47-	Aprons	01 for each trainee
48-	Electric Kettle	02 nos
49-	Masons Jars for 1 gross bottle	01 no
50-	Water Tank with ta p 4'x4'x3'	01 no
51-	Fridge	01 no
52-	Deep Frezer	01 no
53-	Hand die flanger with change parts	01 no
54-	Flange rectified with change parts	01 no
55-	Auto claves 20 lit cap	02 nos
56-	S.S.Vessels with l ids 20 lit cap.	10 nos
57-	S.S. Vessels with lids 6 lit cap. 06	06 nos
58-	S.S.Vessels with l ids 10 lit cap.	06 nos
59-	Incubator with thermostat	01 no
60-	Wooden Basket press (For pineapple juice extraction) 10 kgs capacity	01 no
61-	Gas lighter	01 no
62-	Hand Washing basin with tripod stands	03 nos
63-	Kipps Apparatus	03 nos
64-	Funnels 500m1. & 100m1. seperating	12 nos
65-	Test Tube	25 nos
66-	Micrometer Seam Checking guage'	01 no
67-	Water Bath	02 nos
68	Retorts	01 no
69-	Food Processor	01 no
70-	Oven (drying)	01 no
71-	Pulper	01 no
72-	Homogenizer	01 no
73-	Decanter	01 no
74-	Labelling Machine	01 no
75-	Bottle Stand for 1 gross bottle	01 no

B. CONSUMABLES TOOLS

Sl. No.	Name of the item	Qty.
1	Beaker 50, 100, 250 ml, 500 ml	12 nos
2-	Conical flask-Do-	12 nos
3-	Measuring cylinder 100ml, 200 ml, 500ml,	12 nos
4-	Measuring flask 250 ml	12 nos
5-	Burrete with stands 50 cc	12 nos
6-	Pipettes 25cc & 10 cc, 5 cc	12 nos
7-	Thermo motor (10°C to 110°C)	16 PCS

FURNITURE

Sl. No.	Name of the item	Qty.
1	Working Table with 6-3x21/2 Aluminum tops	01 no
2-	Cup Board (large)	04 nos
3-	Laboratory table with rack (8'x2'-6"-6") and sinks	04 nos
4-	Stools (high)	16 nos
5-	Instructor's table and chairs	1 Set
6-	Racks for keeping books etc.	01 Set
7-	Wooden show case for keeping the samples & display of the products.	02 nos