Upgradation of ITIs into Centres of Excellence-Broad guidelines for implementation of Syllabi of Sector

"Food Processing"

These Centres will be providing multiskill training to meet the skill requirement of particular sector of industry with their active involvement in all aspects of training. The training will be provided in three parts as given below:

- ✓ Training in Basic skill areas for a period of one year.
- ✓ Training in Advanced modules for next six months.
  The testing & certification for the Basic skill training during first year & also for advanced training during next six months will be done under NCVT
- ✓ Training in specialized modules mainly in the industry (The course curricula, duration etc will be designed in consultations with the IMC/local industry. The trade testing & certification for this component will be done jointly by the State Government & Industry. Said certificate will be recognized by NCVT

As per the recommendations of the EFC, Training in the shop floor should constitute alteast 25-40% of the curriculum.

The training programme will have multi-entry and multi-exit provisions:

- ✓ trainee can opt to go to the labour market after completing broad based basic training of one year duration as well as after completing 1½ year of training.
- ✓ trainee can join advanced module as per his/her after some time .Specialized module would be offered after completing BBBT & at least one advanced module .
- ✓ ITI pass out trainee of the particular trade(s) from the conventional system can seek admission for advanced/specialized training in the relevant sector .

As per the approved curricula in the Area/Sector of Chemical , uniform rotation of trainees in six modules each of eight weeks duration as mentioned below is envisaged to be taken up. The trades from where existing infrastructure i.e. equipment/ instructor etc. could be utilized for

the training in **'Sector Food Processing** ' and space requirement of each module is as under:

Basic Module	NAME OF THE MODULE	Trade(s) from where existing infrastructure/equipment/instructor could be utilised	Minimum Space Requirement (Sqm)
FPBT-01	**Food Preservation**	Preservation of Fruit & Vegetables	70
FPBT-02	**Bakery & Confectionary**	Baker & Confectioner	70
FPBT-03	**Milk & Dairy Product**	Dairying	70
FPBT-04	**Agro Processing**	-	70
FPBT-05	**Food Beverages**	-	70
FPBT-06	**Processed Food**	-	70

For each of above module, Trade Practical will be 28 hours /week and Trade theory for 4 hours /week. Apart from above, Generic modules as mentioned below will be taught throughout the year.

Module G-01 BASIC COMPUTER APPLICATION …….. (4 hrs per Week)

Module G-2 -ENTERPRENEURSHIP AND COMMUNICATION SKILLS… ……2 hrs/week

In addition, 4 hours/week have been kept for Library studies & Physical Training

Vocational Instructors:

NAME OF THE MODULE	No. of Vocational Instructors (VIs)
FPBT – 01 to 06	Six VIs one each for 6 module of relevant trades
G-01	One VI with relevant qualification as per need of module .
G-02	One contract/part time / guest faculty for Generic module, ENTERPRENEURSHIP AND COMMUNICATION SKILLS –G-01

The eligibility and other criteria for admission will be as under :

Eligibility : 10^{th} pass under 10+2 system .

Batch size : 96 trainees 16 in each module (20% supernumeraries be allowed to take care of drop outs as already exist under CTS)

Admission:

For basic training, admissions are to be made in August / Feb each year.

Fee Structure:

Fee Structure may be decided by States Govt. in consultation with IMCs . It may be desirable to prescribe a uniform tuition fee for a sector in all Centres of Excellence of a state .

Space:

Since workshop/theory class rooms are envisaged to be accommodated in the existing building of the ITI, therefore, following norms are prescribed only for new infrastructure is to be created .

(1) Workshop space : 80 Sqm. For each modules.

(2) Three Theory classrooms of 30 Sqm each .

The Theory classrooms should have latest infrastructure including AV aids as per details given below:

1. Suitable Chairs/ tables* -As required
2. OHP/Epidiascope - 1 No.
3. Laptop computer/PC (latest) & LCD projector** -1 No.
4. Magnetic white board -1 No.
5. White board -1 No.

6. Flip chart -1 No.
7. Storage Almirah - As required

(* Optimum utilization of space/flexibility may be kept in view)
(**Keeping in view the constraints of funds under the scheme, it is proposed to procure only one set of Laptop computer/PC / LCD projector for CoE. However, States if so desire may procure additional Laptop computer/PC/LCD projector from their funds) While selecting furniture, it should be kept in mind that these are meant for Centres of Excellence. Criteria like maximum flexibility/utilization of space should be kept in view.

Office Equipment:

For each CoE one Scanner, one Photocopy Machine and one PC/printer along with suitable accessories/furniture and internet connection (if not already available in the institute) is proposed to be provided for each CoE, in addition to the equipment prescribed in the syllabus.

Addition/alteration/Construction:

For Civil Works, tentative amount of Rs 40.00 lakhs have been proposed per CoE. It is envisaged to have separate block/ wing for the Cenres of Excellence in the ITI campus. In case space is available in the existing building of an ITI for taking up new areas as per requirement of the cluster of Industry, the existing space will be renovated as per the need. Alternately, separate block will be built up in the same campus keeping in view the space requirements of the Electrical Sector .

While planning for addition /alteration/Construction of workshop and Class rooms, following may be kept in view:

- ✓ concept of a Centre of Excellence
- ✓ the fact that the requirement of funds for construction /addition /alteration for advanced training will be higher than that of basic training

Publicity

Wide publicity & advertisement be given for better response . The role of the local as well as the concerned Industry is very vital for the success of this program.

States may consider providing additional equipment/ other facilities like separate Library/upgradation of existing Library, Conference Hall/ Committee Room etc. from their own funds.

UPGRADATION OF ITIs INTO CENTERS OF EXCELLENCE (CoE)

SECTOR / AREA : FOOD FROCESSING

BROAD BASED BASIC TRAINING

(ONE YEAR)

Sl. No.	Module	Name of Module	Duration
1.	Module 1	Food Preservation	8 weeks
2.	Module 2	Bakery & Confectionary	8 weeks
3.	Module 3	Milk & Dairy Product	8 weeks
4.	Module 4	Agro Processing	8 weeks
5.	Module 5	Food Beverages	8 weeks
6.	Module 6	Processed Food Product	8 weeks

Module I

Food Preservation

AIM

To develop competence in preserving Fruits & Vegetables using different preservation techniques and maintaining Quality Control in Production as well as storage.

DURATION 8 WEEKS

Module I – Food Preservation

	Theory	Practicals
Importance of Food Preservation Technology	☞ Importance of Food Preservation Technology ☞ Common terms used in Food Processing	☞ Identification of different food products available in market
Categorisation of food	☞ Food groups on the basis of pH value, technology, physiology changed conditions	☞ Categorise the food items based on properties
Principles of food preservation	☞ Principle of preservation ☞ Different food Preservation techniques	
Drying/ Dehydration of fruits & vegetables	☞ Principle of food drying/dehydration ☞ General Process of fruit drying ☞ General Process of vegetable drying ☞ General methods of food drying dehydration, sun drying, mechanical drying etc. ☞ Types of dryers ☞ Quality characteristics of dried fruits and vegetables ☞ Treatments prior to drying	☞ Using dryers dry fruits & vegetables ☞ Carry out treatment prior to drying
• Pickles	☞ Principle of pickle production ☞ Theory of different types pickle production ☞ Fermented, oil, vinegar pickles	☞ Production of different types pickle e.g. fermented, oil, vinegar pickles from fruits and vegetables, mixed pickles
Ketchup, Sauce, and chutney	☞ Different types of tomato products ☞ Preparation of tomato	☞ Preparation of tomato ketchup, sauce, puree, paste, chutneys

	Theory	Practicals
	products. ☞ Principle and preparation methods of tomato ketchup, sauce, puree, paste, chutneys	
Canning fruits & vegetables	☞ Canning process flow diagramme for fruits & vegetables ☞ Pretratments. ☞ Canning machinery ☞ Knowledge of chemicals required ☞ Canning of fruits & vegetables	☞ Operation of canning machinery ☞ Canning operations ☞ Caning of seasonal fruits & vegetables
Jam, jelly and Marmalade	☞ Principle of jam and jelly preparation ☞ Flow diagram for preparation of jam and jellies. ☞ Test of pectin for jam and jelly preparation	☞ Preparation of seasonal fruits ☞ Preparation of different fruit jams like, mango, apple, pineapple, banana, amla, guava, papaya, mixed fruit etc ☞ Preparation of jelly from fruits like, apple, guava, jackfruit etc. ☞ Preparation of jam and jelly marmalades ☞ Testing of pectin in fruits ☞ Testing of end point in jam and jelly
Fruit preserves, glaged fruits, fruit bar and toffees	☞ Principle and methods for production of glaged fruits, candy, fruit bar and toffees	☞ Preparation of glaged fruits, candy, fruit bar and toffees.
Vinegar production	☞ Principle of vinegar production. ☞ Different types of vinegars. ☞ Factors involving good quality vinegar.	☞ Preparation of synthetic vinegar ☞ Preparation of fermented vinegar ☞ Preparation of different fruit vinegar, flavoured vinegars
Wastes	☞ Wastes from fruits and	☞ Preparation of products

	Theory	Practicals
Utilization from fruit and vegetables	vegetables. ☞ Processing techniques for proper utilization of wastes from fruits and vegetables.	from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches
Quality Control	☞ Quality factors in fruit and vegetable processing & preservation	☞ Tests for quality evaluation
Nutritional qualities and composition of fruits and vegetables	☞ Analytical methods for evaluation of chemical and nutritional composition of fruits and vegetables	☞ Analysis of fruits and vegetables for their quality.
Storage and packaging	☞ Need and importance of storage and packaging ☞ Methods ☞ Storage techniques for fruits, vegetables and grains ☞ Cold storage, refrigeration ☞ Packaging materials used ☞ Selection of appropriate packing methods	☞ Pack the given food products and seal

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Hand operated moisture meter (to be shared)	04
2.	Litmus papers	16
3.	Product catalogue of different product	As required
4.	Hand sealing machine (to be shared)	04
5.	Bottle cap tightening machine (to be shared)	04
6.	Hand operated plastic packaging machine (to be shared)	04
7.	Food colour packets	As required
8.	Preservatives packets	As required
9.	Spring balance (to be shared)	04
10.	Fruit knife (to be shared)	08
11.	Spoons (different sizes)	16 sets
12.	Measuring glass (to be shared)	08
13.	Hand gloves	16
14.	Apron	16
15.	Cap	16
16.	Boots	16
17.	Hand bag big size	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Cabinet dryer (Electrical)**	01
2.	**SS trays**	As required
3.	**Lemon squeezer**	06
4.	**Bottle washer**	02
5.	**Crown corking machine (Hand operated/ pedal operated)**	01
6.	**Baby Fruit pulper**	02
7.	**Mixer-grinder/Food processors**	04
8.	**Water purifier**	02
9.	**Sulfuring chamber**	01
10.	**Blancher cum sterilizer**	01
11.	**Oven :** 5 KW,	01
12.	**Hand / table model refractometer :** Abbes type, 0-32; 28-70. 58-90 of 0-100 (Bench type)	02
13.	**Storage Bins of different capacity :**	As required
14.	**Electronic balance**	01
15.	**Electric oven :** For moisture determination, 0-250 °C, digital display, 2'X2'X2'	02
16.	**Moisture box :** Aluminum, 100 g capacity cylindrical	02
17.	**Vinegar generator :**	01
18.	**Fermenter :**	01
19.	**Vegetable slicing machine**	01
20.	**Automatic pouch machine/ filler sealer machine :** including a batch coding, perforation and notching unit	01
21.	**Pulping machine for fruits and vegetables**	01
22.	**Fruit mill** Junior Model, 0.5 Ton/h with 1 hp motor.	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
23.	**Gel meter** .	01
24.	**Auto clave :** For Sterilization of cans,	01
25.	**Vacuum pan**	01
26.	**Vernier Caliper :** 15 cm. 0.01 mm LC	04
27.	**Screw Gauge :** Micrometer, 0.001 mm LC, 10 cm cap	04
28.	**Steel Scale :** 12 " standard steel	04
29.	**Steel tape :** Scales 1 meter, and of 50 ft	04
30.	**Weight box :** For balances	01
31.	**Cutting equipments :** Different knives, Cutters for fruits / Vegetables	04 sets
32.	**Sinks :** standard size	02
33.	**Hot plate :** Electrical 2 KW	02
34.	**Pickle Mixer :** Rotatory type, Contact Parts of SS	02
35.	**Heat sealing machine :** Hand / pedal operated	01
36.	**Tank SS :** 50 liters capacity, cylindrical with cap	01
37.	**Syrup tanks :** 50, 100 lit capacity SS	01
38.	**Pressure cooker :** 5 Kg and 10 Kg SS	01 each
39.	**Liquid filling machine :** 200 ml, 500 ml, 1000 ml. Manual	01 each
40.	**SS Filter :** Sieve type cloth filter, hydraulic,	01
41.	**Sugar coating pan :** SS, Revolving type with speed control,	01
42.	**Bottle opener :** Heavy duty, Stainless Steel	04
43.	**Burette :** 50 ml digital Automatic/ ordinary glass	06
44.	**Pipette :** 5-50 ml capacities	06
45.	**Lab glass wares :** Different sizes and types	As required
46.	**Working tables :** Stainless Steel Size 6' X 3'	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
47.	**Improved stoves :** Made of MS with proper safety Measures	02
48.	**Stainless steel/ Aluminum pots :** Different Capacities	As required
49.	**Stainless steel knives :** 12-15 cm blade	As required
50.	**Spoons :** Stainless steel, various shapes and sizes	As required
51.	**Household sieves :** Stainless steel	As required
52.	**Wooden spoons :** Different sizes	As required
53.	**Hand operated pulp extractor :** Made of stainless steel	01
54.	**Solar dryer (cabinet type) :** Complete with solar box, Size approx 6' X 3'	01

A)	**Furniture**		
	Class Room • Instructor Chair & Table • Dual Desk	: :	 01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	: : :	 04 Nos. 16 Nos. 01 No.
	Tool Cabinet	:	01 No.
	Trainees Locker with space for 16	:	01 No.
	First Aid Box	:	01 No.
	Book Shelf (glass panel)	:	01 No.
	Storage rack	:	01 No.

Module II

Bakery and Confectionary

AIM

To develop professional skills in handling modern equipment used for Bakery and Confectionary item and maintaining prescribed standard in production packing and storage.

DURATION 8 WEEKS

Module II – Bakery and Confectionary

	Theory	Practicals
Bakery and confectionery in food industry	☞ Importance of bakery and confectionery in food industry ☞ Industrially important cereals	
Bakery Products • Flour	☞ Different industrially important bakery products. ☞ Flours for the bakery products ☞ Quality of flour for the production of bakery items.	☞ Production of quality flour for bread, biscuit and cakes ☞ Production of plain, fermented, malt, rye flour ☞ Flour, fat, bakers yeast, sugar and salt, I.S.I. standards for flour, fat, Baker's yeast.
• Bread	☞ Principle involved for bread production ☞ Different types of breads and their uses ☞ Ingredients used in bread production	☞ Use of different food machinery for bread production ☞ Production of plain bread, fermented bread, protein rich bread and special breads
• Biscuit and cookies	☞ Basic method of biscuit production. ☞ Ingredients for biscuit production. ☞ Machinery involved in biscuit production ☞ Factors affecting the quality of product	☞ Production of different types of popular biscuits. ☞ Production of different types of specialized biscuits. ☞ Production of different types of other products like cookies, crackers

	Theory	Practicals
Cake	☞ Methods for the production of cakes ☞ Ingredients for cake production ☞ Machinery involved in cake production ☞ Factors affecting the quality	☞ Production of different types of popular cakes ☞ Production of different types of specialized cakes
Starch	☞ Availability of starch in different cereals ☞ Extraction of starch ☞ Different products of grain starch	☞ Preparation of corn starch, starch biscuits, Namkins, snacks
Quality standards	☞ Quality standards and evaluation of product	☞ Testing of raw material and product for their quality.
Primary processing equipment	☞ Equipment used e.g. flour mill, mixer, molding machines, oven balance, packing machines ☞ Location of faults ☞ Safety	☞ Handling of equipment safely ☞ Fault identification and removal of faults
Storage and packaging	☞ Need and importance of storage and packaging for bakery items ☞ Methods of storage & packaging	☞ Pack the given food products and seal

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Hand operated moisture meter (to be shared)	04
2.	Moulds of biscuit & breads (to be shared)	08
3.	Spring balance (to be shared)	04
4.	Bread cutting knife	16 sets
5.	Knife of different size (set)	16 sets
6.	Spoons	16 sets
7.	Measuring glass (to be shared)	08
8.	Fruit knife	16 sets
9.	Dies (to be shared)	04
10.	Hand gloves	16
11.	Apron	16
12.	Cap	16
13.	Boots	16
14.	Hand bag	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Flour mill/ mini grain mill :** Standard size	01
2.	**Planetary mixer :** 3 gear,	01
3.	**Moulding machines**	01
4.	**Sheeting machine**	01
5.	**Bread cutting machine**	01
6.	**Oven :** Standard size with temperature control	01
7.	**Packing machine**	01
8.	**Electronic balance**	01
9.	**Physical balance**	01
10.	**Working table SS**	01
11.	**Toffee dies**	01
12.	**Biscuit moulds of different sizes :**	As required
13.	**Cake dies**	As required
14.	**Electric oven**	01
15.	**Moisture box**	01
16.	**Flash evaporator**	01
17.	**Can body reformer**	01
18.	**Can seamer**	01
19.	**Exhaust box**	01
20.	**Auto Clave**	01
21.	**Cup sealer**	01
22.	**Vacuum pan**	01
23.	**Vernier Caliper :** 15 cm. 0.01 mm LC	02
24.	**Screw Gauge :** Micrometer, 0.001 mm LC, 10 cm cap	02
25.	**Steel scale :** 12 " standard steel	04
26.	**Steel tape :** Scales 1 meter, and of 50 ft	04
27.	**Weight box :** For balances up to 2 Kg	02
28.	**Cutting equipments :** Different knives, Cutters for fruits /Veg	As required

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
29.	**Sinks :** standard size	01
30.	**Hot plate :** Electrical 2 KW	01
31.	**Pickle Mixer :** Rotatory type, Contact Parts of SS	01
32.	**Heat sealing machine :** Hand / pedal operated	01
33.	**Tanks SS :** 50 liters capacity, cylindrical with cap	01
34.	**Syrup tanks :** 50-100 lit capacity SS	01
35.	**Pressure Cooker :** 5 Kg and 10 Kg SS	01 each
36.	**Liquid filling machine :** For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	01 each
37.	**SS Filter :** Sieve type cloth filter, hydraulic,	01
38.	**Sugar coating pan :** SS, Revolving type with speed control,	01
39.	**Bottle opener :** Heavy duty, Stainless Steel	01
40.	**Burette :** 50 ml digital Automatic/ ordinary glass	06
41.	**Pipette :** 5-50 ml capacities, glass	04
42.	**Working tables :** Stainless Steel Size 6' X 3'	01
43.	**Improved stoves :** Made of MS with proper safety Measures, Valves etc	02
44.	**Stainless steel / Aluminum pots :** Different Capacities	01 set
45.	**Wooden spoons :** Different sizes	01 set
46.	**Solar dryer (cabinet type) :** Complete with solar box, Size approx 6' X 3'	01

A)		
	Class Room • Instructor Chair & Table • Dual Desk	 01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	 04 Nos. 16 Nos. 01 No.
	Tool Cabinet	01 No.
	Trainees Locker with space for 16	01 No.
	First Aid Box	01 No.
	Book Shelf (glass panel)	01 No.
	Storage rack	01 No.

Module III

Milk and Dairy Products

AIM

- To develop abilities in handling equipment, treatment and producing milk related product under prescribed hygienic condition.
- To develop skill in storing, packaging and maintaining nutrition values.

DURATION 8 WEEKS

Module III – Milk and Dairy Products

	Theory	Practicals
Dairy industry	☞ Importance of dairy industry ☞ Introduction to operation flood (white revolution)	
Milk	☞ Property of milk ☞ Quality of raw milk ☞ Products made from the milk ☞ Introduction to different dairy products useful for marketing.	☞ Testing of milk for its quality ☞ Primary processing of market milk. ☞ Storage of milk
• Processing of Milk	☞ Principle of milk processing ☞ Method of production of pasteurized milk ☞ Standard, toned, double toned flavoured milks. ☞ Ingredients of special milks, fermented milk	☞ Production of pasteurized milk ☞ Production of standard, toned, double toned flavoured milks, fermented milk. ☞ Storage of products
• Dairy Products	☞ Preparation methods of Cheese, Chhana, Mawa, ☞ Preparation methods of Dahi, Srikhand, Cream, buttermilk	☞ Preparation of Cheese, Chhana, Mawa,/ ☞ Preparation of Dahi, Srikhand, Ghee, Cream, buttermilk etc.
• Ghee	☞ Different methods of Ghee production ☞ Quality of ghee	☞ Production of Ghee by different methods
• Butter	☞ Method of butter production ☞ Quality of butter	☞ Preparation of butter. ☞ Test of quality of butter

	Theory	Practicals
• Dairy sweets	☞ Preparation methods of different dairy based sweets ☞ Storage of sweets.	☞ Preparation of different dairy based sweets.
• Ice-cream	☞ Principle of ice-cream production ☞ Method of ice-cream production ☞ Quality of ice cream ☞ Different types of ice creams	☞ Preparation of ice cream. ☞ Quality evaluation of ice cream ☞ Storage of ice-cream
• Other Dairy products	☞ Different dairy products like dried milk, condensed milk	☞ Preparation of different dairy products like dried milk, condensed milk, cheese
Processing equipment	☞ Equipment used e.g. Cream Separator, deep fridge, cheese vat, pasteurizer, kettle, butter churner, boiler,(optionally mini dairy plant) ☞ Maintenance of equipment ☞ Safety	☞ Handling of equipment safely ☞ Fault identification and removal of faults ☞ Safe operation
Storage and packaging	☞ Need and importance of storage and packaging ☞ Methods	☞ Pack the given food products and seal

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Lactometer (to be shared)	04
2.	Dairy product catalogue of different product	02 sets
3.	Packaging machine hand operated (to be shared)	04
4.	Milk testing kit (to be shared)	04
5.	Hand operated weighting unit (to be shared)	04
6.	Hand operated sealing machine (to be shared)	04
7.	Fat measuring kit (to be shared)	04
8.	Electric Kittle (to be shared)	04
9.	Moisture box (to be shared)	04
10.	Measuring glass (to be shared)	08
11.	Hand gloves	16
12.	Apron	16
13.	Cap	16
14.	Boots	16
15.	Hand bag	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Mini dairy plant :** Complete Mini-processing unit for milk.	01
2.	**Milk Chiller :** For chilling milk up to a temperature of about –10 °C	01
3.	**Milk cans :** Made of steel/ Aluminium, 40 – 100 lit capacity	As required
4.	**Cream separator :** Motor operated, Centrifugal, capacity up to 1-2 Kg/ cream per min.	01
5.	**Cheese vat :** Made of heavy Stainless steel (306), size approx. 4'X 2.5'X 1' with proper outlet and taps	01
6.	**Plate pasteurizer**	01
7.	**Butter churner**	01
8.	**Boiler**	01
9.	**Deep fridge**	01
10.	**Steam jacketed kettle with surface scrapper**	01
11.	**Mawa machine**	01
12.	**Crown capping machine**	01
13.	**Form fill seal machine**	01
14.	**Ice cream plant**	01
15.	**Cenfrifuge :** For Fat estimation in milk,	01
16.	**Gerber tubes for fat estimation**	01
17.	**Electric oven**	01
18.	**Moisture box**	01
19.	**Automatic pouch machine / filler sealer machine**	01
20.	**Kettle**	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
21.	**Flash evaporator** .	01
22.	**Can body reformer**	01
23.	**Can seamer**	01
24.	**Exhaust box**.	01
25.	**Cup sealer**	01
26.	**Vacuum pan**	01
27.	**Vernier caliper :** 15 cm. 0.01 mm LC	02
28.	**Screw Gauge :** Micrometer, 0.001 mm LC, 10 cm cap	04
29.	**Steel scale :** 12 " standard steel	02
30.	**Steel tape :** Scales 1 meter, and of 50 ft	02
31.	**Weight box :** For balances	01
32.	**Cutting equipments :** Different knives, Cutters for fruits /Veg	As required
33.	**Sinks :** standard size	01
34.	**Hot plate :** Electrical 2 KW	01
35.	**Pickle mixer :** Rotatory type, Contact Parts of SS	01
36.	**Heat sealing machine :** Hand / pedal operated	01
37.	**Tanks SS :** 50 liters capacity, cylindrical with cap	01
38.	**Syrup tanks :** 50, 100 lit capacity SS	01
39.	**Pressure cooker :** 5 Kg and 10 Kg SS	01
40.	**Liquid filling machine :** For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	As required
41.	**SS filter :** Sieve type cloth filter, hydraulic,	01
42.	**Sugar Coating pan :** SS, Revolving type with speed control,	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
43.	**Bottle opener :** Heavy duty, Stainless Steel	01
44.	**Burette :** 50 ml digital Automatic/ ordinary glass	01
45.	**Pipette :** 5-50 ml capacities, glass	As required
46.	**Lab glasswares :** Different sizes and types	As required
47.	**Working tables :** Stainless Steel Size 6' X 3'	01
48.	**Improved stoves :** Made of MS with proper safety Measures, Valves etc	01
49.	**Stainless steel / Aluminum pots :** Different Capacities	As required
50.	**Wooden spoons :** Different sizes	As required

A)	Furniture		
	Class Room • Instructor Chair & Table • Dual Desk	: :	 01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	: : :	 04 Nos. 16 Nos. 01 No.
	Tool Cabinet	:	01 No.
	Trainees Locker with space for 16	:	01 No.
	First Aid Box	:	01 No.
	Book Shelf (glass panel)	:	01 No.
	Storage rack	:	01 No.

Module IV

Agro Processing

AIM

To develop expertise in operation of processing equipment and produce different Agro products maintaining Quality standards including storage and packing.

DURATION 8 WEEKS

Module IV – Agro Processing

	Theory	Practicals
Agro processing industry	☞ Introduction of agro processing industry ☞ Scope of agro processed products for entrepreneurship	☞ Conducting survey of the different agro products from the market
Machinery in Agro processing	☞ Different machines used in agro processing industry ☞ Working principles, cost and capacity of machines in agro processing industry	☞ Working with agro processing machinery ☞ Capacity evaluation of different agro processing machines
Cereal grains, wheat	☞ Different grains suitable for agro processing ☞ Primary processing of wheat ☞ Cleaning, grading, milling ☞ Standards for the wheat flour ☞ Production of different wheat product	☞ Cleaning, grading and other pre-processing activities ☞ Production of whole wheat flour ☞ Production of Suji, Maida, Dalia ☞ Packaging and labeling the product
Dal (Pulse) Milling	☞ Principle of dal milling ☞ Pulses suitable for milling ☞ Different Methods of dal milling ☞ Dal mills ☞ Pre-treatment in dal milling ☞ Waste utilization	☞ Pre-treatment in dal milling like cleaning, grading, soaking, drying ☞ Milling pulses for production of dal, e.g. pigeon pea, green gram, Bengal gram ☞ Packaging and uses of wastes from dal mill
Packaged whole grains	☞ Suitablility of whole grains for marketing ☞ Production of packed whole grains ☞ Packaging, lebeling, storage and marketing of	☞ Production of packed whole grains like Bengal gram, black gram, green gram, groundnut

	Theory	Practicals
	whole grains	
Spice Grinding	☞ Spices suitable for grinding ☞ Principle and method of spice grinding ☞ Machinery used for spice grinding ☞ Ensuring good quality product	☞ Procurement and Pre-processing of spices, cleaning, grading, destoning ☞ Working with machinery for spice grinding ☞ Production of spice powders from, coriander, black peeper, red chilly, turmeric ☞ Packaging of whole spice grains for marketing
Oil Milling	☞ Methods of oil milling ☞ Different types of oil expellers ☞ Oilseeds, properties and suitability ☞ Process flow chart for oil milling ☞ Filtration and packaging	☞ Working of oil expellers ☞ Oil expelling from different oil seeds e.g. mustard, groundnut, rapeseed, sunflower ☞ Filtration and packaging of oil
Rice Milling	☞ Properties of paddy for rice milling ☞ Process of rice milling ☞ Hullers	☞ Processing of paddy for rice
Groundnut decorticators	☞ Different groundnut decorticators ☞ Decortication, cleaning, grading and packaging	☞ Working with groundnut decorticators for production of decorticated groundnut
Storage and packaging	☞ Need and importance of storage and packaging ☞ Methods	☞ Pack the given food products and seal
Quality	☞ Quality standards for packed processed products	☞ Development of good quality package and testing of the quality with market survey and demand
Processing equipments	☞ Equipment used e.g. Flour mill, Mini grain mill, pulverizer, hammer mill,	☞ Handling and practice on the equipment ☞ Fault identification and

	Theory	Practicals
	Flour separator, Dal Mill, Packing machine (Heat sealing machine), Balance ☞ Maintenance of equipment ☞ Safety	removal of faults

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Moisture meter Hand operated (to be shared)	04
2.	Hand operated spring balance (to be shared)	04
3.	Hand operated packaging kit (to be shared)	08
4.	Sieve set	16
5.	Oil testing kit (to be shared)	04
6.	Pouch packaging / sealing kit (to be shared)	04
7.	Moisture box (to be shared)	04
8.	Measuring glass (to be shared)	08
9.	Hand gloves	16
10.	Apron	16
11.	Cap	16
12.	Boots	16
13.	Hand bag	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Hammer mill :** Power operated, one HP 50 Kg/hr	01
2.	**Groundnut decorticator hand operated :** Hand operated 20 Kg/hr	01
3.	**Mini dal mill :** Power operated, 2 HP 100 Kg/hr	01
4.	**Mini rice mill :** Power operated, 2 HP 100 Kg/hr	01
5.	**Mini oil expeller :** Power operated, 10 HP 25 lit/hr	01
6.	**Grain cleaner :** Power operated, 01 HP; 300 Kg/hr	01
7.	**Mini grain mill :** Power operated, 01 HP 20 Kg/hr	01
8.	**Wheat flour mill :** Power operated 5 HP 100 Kg/hr	01
9.	**Micro pulverizer :** Power operated, 2 HP 50 Kg/hr	01
10.	**Storage bins of different capacity :** Aluminium, 100-1000 Kg Capacity with proper outlet and inlet	As required
11.	**Platform scale balance :** 100 Kg Capacity,	01
12.	**Electric oven :** For moisture determination, 0-250 °C, digital display, 2'X2'X2'	01
13.	**Moisture box :** Aluminium, 100 g capacity cylindrical	01
14.	**Destoner :** For cleaning light materials, air classifier type	01
15.	**Packaging material :** PP, PE, laminated, Stand pouches	As required

OTHER REQUIREMENTS SUGGESTED FOR A BATCH OF 16 STUDTNES

(Space, Furniture & Teaching aids)

A)	**Furniture**		
	Class Room • Instructor Chair & Table • Dual Desk	: :	01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	: : :	04 Nos. 16 Nos. 01 No.
	Tool Cabinet	:	01 No.
	Trainees Locker with space for 16	:	01 No.
	First Aid Box	:	01 No.
	Book Shelf (glass panel)	:	01 No.
	Storage rack	:	01 No.

Module V

Food Beverages

AIM

To develop proficiency in producing different Beverages using different processing equipment and maintain world class standard.

DURATION 8 WEEKS

Module V – Food Beverages

	Theory	Practicals
Food beverage	☞ Importance of food beverages for entrepreneurship ☞ Scope of food beverages	
Introduction to different food beverage	☞ Types of beverages ☞ Need of particular beverage ☞ Classification of food beverages	
• Raw material	☞ Raw materials used for beverages ☞ PFA- standards for food beverages	
• Synthetic soft drinks	☞ Synthetic soft drinks ☞ Process of manufacture of soft drinks ☞ Quality of water for soft drinks ☞ Food additives used in soft drinks ☞ Quality control in a soft drink manufacturing industry	☞ Selection of ingredients for soft drink production ☞ Preparation of different soft drinks ☞ Packaging of the soft drinks (Bottling, polu pouches, pepsi type, can) ☞ Quality testing in soft drinks
• Fruit Beverages	☞ Introduction to different fruits juices ☞ Principle and methods. ☞ Machinery involved in different fruits juice extraction ☞ Ready-To-Serve (RTS) fruit beverages, ☞ Squash, fruit juice, nectar concentrate, syrup, sherbets ☞ Process of manufacture ☞ Quality control in Beverage industry. ☞ FPO standards for fruit Beverages.	☞ Production of juices from fruits ☞ Production of Ready-To-Serve (RTS) fruit beverages, ☞ Production of squash, fruit juice, nectar, concentrate ☞ Quality testing of beverage ☞ Fruits used : mango, orange, papaya, lemon, jamun

	Theory	Practicals
• Miscellaneous Beverage	☞ Beverage from other materials, grains ☞ Malt, vegetable (tomato), herbs & medicinal plants	☞ Preparation of malt syrup, badam , psta, hearbal, concentrates, rose syrup
Mineral water	☞ Principle and method for production of mineral water ☞ Quality standard (BIS) of water. ☞ Different types of water, RO, UV, Ozonated	☞ General purification techniques ☞ Production of mineral water from mini water treatment plant ☞ Quality of packaged water
Soda water	☞ Principle and Method of soda water production ☞ Quality standards for soda water	☞ Production of soda water ☞ Packaging, labeling and storage of soda water
Fermented beverages	☞ Principle and methods. ☞ Raw material ☞ Fermentation ☞ Storage	☞ Preparation of malt extract ☞ Preparation of cider, vinegar, banana, pineapple beverages
Primary processing machinery	☞ Equipment used e.g. Juice extractor, pulper, fermenter, vinegar generator, crown corking machine, bottle filling machine, Soda water machine, basket press, filter press ☞ Maintenance of machines ☞ Safety	☞ Handling of equipment safely ☞ Fault identification and removal of faults

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Litmus paper	As required
2.	Food colour kit	16
3.	Bottle sealing unit (to be shared)	08
4.	Juice extracting unit (to be shared)	08
5.	Mixie (to be shared)	02
6.	Soda making machine (to be shared)	02
7.	Crown cooking machine (to be shared)	02
8.	Food quality testing kit (to be shared)	02
9.	Food beverage packets	16
10.	Moisture meter Hand operated (to be shared)	04
11.	Moisture box (to be shared)	04
12.	Measuring glass (to be shared)	04
14.	Hand gloves	16
15.	Apron	16
16.	Cap	16
17.	Boots	16
18.	Hand bag	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Oven :** 5 KW,	01
2.	**Platform scale balance :** 100 Kg Capacity,	01
3.	**Meat cutting knives :** Heavy duty SS	As required
4.	**Seed germinator :** Cabinet type, Different chambers, Temp and RH Controller	01
5.	**Vinegar generator :** Chamber made of SS, with sparger and baffles	01
6.	**Fermenter :** Bioreactor, SS, with sparger and baffles	01
7.	**Vegetable slicing machine**	01
8.	**Automatic pouch machine / filler sealer machine**	01
9.	**Plumping Machine for fruits and vegetables**	01
10.	**Kettle**	01
11.	**Fruit mill**	01
12.	**Gel meter**	01
13.	**Can body reformer**	01
14.	**Can seamer**	01
15.	**Exhaust box**	01
16.	**Auto clave**	01
17.	**Cup sealer**	01
18.	**Steel scale :** 12 " standard steel	02
19.	**Steel tape :** Scales 1 meter, and of 50 ft	02
20.	**Weight box :** For balances	01
21.	**Cutting equipments :** Different knives, Cutters for fruits /Vegetables	As required
22.	**Sinks :** standard size	01
23.	**Hot plate :** Electrical 2 KW	01
24.	**Pickle mixer :** Rotatory type, Contact Parts of SS	01
25.	**Heat sealing machine :** Hand / pedal	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
	operated	
26.	**Tanks SS :** 50 liters capacity, cylindrical with cap	01
27.	**Syrup tanks :** 50, 100 lit capacity SS	01 each
28.	**Pressure Cooker :** 5 Kg and 10 Kg SS	01 each
29.	**Liquid filling machine :** For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	01 each
30.	**SS filter :** Sieve type cloth filter, hydraulic,	01
31.	**Sugar coating pan :** SS, Revolving type with speed control,	01
32.	**Bottle opener :** Heavy duty, Stainless Steel	04
33.	**Burette :** 50 ml digital Automatic/ ordinary glass	02
34.	**Pipette :** 5-50 ml capacities, glass	02
35.	**Improved stoves :** Made of MS with proper safety Measures, Valves etc	02
36.	**Stainless steel / Aluminum pots :** Different Capacities	As required
37.	**Wooden spoons :** Different sizes	As required

A)	Furniture		
	Class Room • Instructor Chair & Table • Dual Desk	: :	 01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	: : :	 04 Nos. 16 Nos. 01 No.
	Tool Cabinet	:	01 No.
	Trainees Locker with space for 16	:	01 No.
	First Aid Box	:	01 No.
	Book Shelf (glass panel)	:	01 No.
	Storage rack	:	01 No.

Module VI

Processed Food Products

AIM

- To develop marketing skills for processed food products.
- To develop skills in processing of meat, poultry and other Agro products.

DURATION 8 WEEKS

Module VI – Processed Food Products

	Theory	Practicals
Meat	☞ Importance of meat processing for entrepreneurship ☞ Scope of meat processing industry	
• Meat Processing	☞ Methods of meat processing. ☞ Post mortem changes during meat processing. ☞ Quality of meat ☞ Canning, pickling, preservation of meat.	☞ Meat processing : cutting (carcassing), cleaning, storage, sanitation ☞ Handling and practice on meal processing equipment safely ☞ Practical on canning, pickling, preservation of meat
Fish Processing	☞ Principle and methods of fish processing ☞ Quality of fish suitable for processing ☞ Dehydration, canning, pickling of fish, Fishmeal protein, fishmeal powder	☞ Experiment on fish quality for processing ☞ Production of Dehydrated canned, pickled fish, Fish meal protein, fish meal powder
Poultry • Egg	☞ Importance of egg production ☞ Storage and preservation methods of egg ☞ Production methods of egg albumin, powder and other useful products from egg ☞ Quality of egg and products ☞ Pickling, canning of egg	☞ Production methods of egg albumin, powder and other useful products from egg ☞ Preparation of egg pickle ☞ Preparation of canned egg and canned egg pickle
• Poultry processing	☞ Methods of chicken processing	☞ Chicken processing ☞ Quality testing of chicken meat ☞ Preparation of processed product from chicken e.g.

	Theory	Practicals
		Sausages, pickle, dried chicken
Soya Products	☞ Details of soya product ☞ Processing methods of soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand, namkins	☞ Preparationof soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand, namkins
Papad	☞ Raw material for papad production ☞ Method of preparation of different types of papad ☞ Packaging and quality of papad	☞ Preparation of ingredients for papad production ☞ Preparation of different types of papad
Sprouted Grains	☞ Importance of sprouted/germinated foods ☞ Material selection for sprouting ☞ Methods for preparation of germinated grains ☞ Requirements for sprouting grains ☞ Individual and mixed sprouted grains	☞ Selection of raw material for Preparation of sprouting ☞ Preparation of individual sprouted grains, pulsed, groundnut, wheat, alfa etc. ☞ Preparation of mixed sprouted grains ☞ Package development and marketing of sprouted grains
Medicinal and herbal Products	☞ Importance of medicinal and herbal products ☞ Processing methods of medicinal and herbal products	☞ Processing of herbal products
Natural colour and flavour and food additives	☞ Different species for colour and flavour production ☞ Colours and flavours used in food industry ☞ Methods of production of natural colour and flavours	☞ Preparation and extraction of natural colour and flavours ☞ Preparation of food additives

	Theory	Practicals
	☞ Production method of other food additives	
Food additives	☞ Use of different food additives for preservation	☞ Food preservation using natural and chemical additives ☞ Value addition with chemicals and additives
Primary processing machinery	☞ Equipment used e.g. Meat mincer, cutting machine, canning unit, packaging machine ☞ Soya plant, papad press, etc. ☞ Seed germinator, refrigerator, etc. ☞ Location of faults ☞ Safety	☞ Handling and practice on the equipment ☞ Fault identification and removal of faults ☞ Safe operation
Marketing	☞ Market survey procedures ☞ Strategies for marketing ☞ Methods of marketing feedback ☞ Cost analysis & attractive packaging ☞ Advertising	☞ Contact customers ☞ Estimate requirements ☞ Collect feedback ☞ Workout cost of product & competition

Trainees Kit

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	Moisture meter (to be shared)	04
2.	Moisture box (to be shared)	04
3.	Knife	16 sets
4.	Cutters (to be shared)	04
5.	Sprouter (to be shared)	04
6.	Food colour kit	As required
7.	Heat sealing machine (to be shared)	04
8.	Food packaging kit (to be shared)	04
9.	Plastic packaging sealing machine (to be shared)	04
10.	Litmus paper	As required
11.	Lactometer (to be shared)	04
12.	Measuring glass (to be shared)	08
13.	Hand gloves	16
14.	Apron	16
15.	Cap	16
16.	Boots	16
17.	Hand bag	16

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
1.	**Platform Scale balance :**	01
2.	**Meat mincer**	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
3.	**Soya milk plant with kettle and paneer press :**	01
4.	**Papad press and dough mixer :** Hand operated , 50 papad/h	01
5.	**Meat Cutting knives,:** Heavy duty SS	As required
6.	**Seed germinator :** Cabinet type, Different chambers , Temp anf RH Controller	01
7.	**Vinegar generator :** Chamber made of SS, with sparger and baffles	01
8.	**Fermenter :** Bioreactor , SS, with sparger and baffles	01
9.	**Vegetable slicing machine**	01
10.	**Auto clave**	01
11.	**Working tables :** Stainless Steel Size 6' X 3'	01
12.	**Stainless steel knives: :** 12-15 cm blade	As required
13.	**Spoons :** Stainless steel, various shapes and sizes	As required
14.	**Household sieves :** Stainless steel	As required

A)	Furniture		
	Class Room • Instructor Chair & Table • Dual Desk	: :	01 No 08 Nos.
	Workshop/Lab • Suitable Work tables • Stools • Discussion Table	: : :	04 Nos. 16 Nos. 01 No.
	Tool Cabinet	:	01 No.
	Trainees Locker with space for 16	:	01 No.
	First Aid Box	:	01 No.
	Book Shelf (glass panel)	:	01 No.
	Storage rack	:	01 No.

GENERIC MODULE ON BASIC COMPUTER APPLICATION
(4 hrs per Week)

Practical	Theory
Booting the computer, opening windows menu, using the mouse, refresh computer desktop using right click of the mouse, create a directory in xp and linux, format a floppy, create a file using note pad, save the file in floppy, copy the file into hard disk, copy a file from hard disk to floppy, create a directory in floppy, create a directory in hard disk, use my documents, use start menu for opening an application, to open a document recently written, change control panel settings for display, change the volume name of the hard disks using system properties, familiarize with key boards and keys.	Introduction to Computer fundamentals and its parts, familiarizing with disk drives, Booting of a computer system, using the mouse, Right click, left click and use of operating systems like Windows XP, linux, menu system, tool bars, file structures, directories, moving and copying a file from floppy to hard disk, hard disk to floppy disk, creating directories. Formatting floppy disk.
Techniques of changing desktop wall paper, changing desktop screen properties, control panel, user accounts, customizing icons, writing a sample text using notepad, using paint for drawing figures to get accustomed with mouse. Saving a file. Using windows explorer, install a software, remove a software, add new hardware to the system (like a printer, change the system date and time, changing the regional settings of the system like country, currency, date format, using start menu, creating desktop short cuts	Use of desktop, control panel settings, explorer, regional settings, creating shortcuts, use of simple applications like paint, notepad,
Open internet explorer, change the settings in IE, customize internet explorer for default applications, enable cookies, change the security settings, set up an internet connection, user ID and password saving in the computer for future usage, set up outlook express for an e-mail account, setup server authentication settings, receive and send e-mail from the account. Search using Yahoo and Google for certain topics, download a file from the internet, save the download file. Set up the net meeting using MSN or Yahoo messenger	Study of internet explorer, modem, settings in the IE and modem, dial up and broadband connections, outlook express, viewing E-mail from the web site and outlook express, creating e-mail accounts, using search engines, video conferencing, MS chat
Open MS WORD, create a new file, save a file, open an exiting file, save as a text file type a paragraph, set for left and right margins, change the letters from upper to lower case, vice versa,	Creating sample documents using MS WORD. Text wrapping, text formatting, changing letters to different case, drawing table, mail merging, page formatting, using

cut a paragraph, copy a paragraph, setup tab positions, set hanging indents, draw a simple table, insert rows, insert columns, erase rows, erase columns, search the documents for spelling collections, print the letter in a printer attached, in portrait and landscape. Open excel, and workout the following to understand the theory commands: Prepare a salary bill for ABC organization with column A for names, column B for basic salary, column C for DA, column D for addition of B & C to get the full salary. Add the column D into a new cell as TOTAL amount. Copy the sheet into sheet 2. Sort the sheet 1 as per names. Sort the sheet 2 as per Total salary. Insert two rows in sheet 1. Merge these rows. Enter heading as salary bill. Use borders ad shading for the entire used column. Print the sheet using set print area with margins, and use scale factor for reduction and enlargement. Use portrait and landscape.	different font types, printing a document Using excel as spread sheet, familiarizing with cells, formulae, text, numbers and date, using shortcuts for entering date and numbers in progressive cells, copying formulae, text and numbers, using borders, merging cells, unmerging, changing cell width, row height, printing an area of the sheet, options of printing like fit to paper, shrinking etc. using different in a workbook, changing colors of cells, fonts, text

Tools, Machinery & Equipments, etc. for a batch of 16 trainees

Sl.No.	Item	Quantity
1	Pentium IV computer or latest with 512 MB RAM with following accessories DVD combo drive with latest X version, hard disk with 80 GB or above, 17" Monitor, AGP graphics card with 64 mb, 10/100 Ethernet card, Modem	8 Nos.
2	Centralized UPS of 1 KVA capacity or 4 UPS of 500 VA	
3	Laser Printer	1 No.
4	Dot Matrix Printer	1 No.
5	Windows XP operating system	As required.
6	M-S Office 2000	As required
7	Suitable computer tables, computer chairs	As required
8	Tool cabinet and trainees locker	2 each
9	Book Shelf (with glass panel)	1 No.
10	Shoe rack	As required
11	Vacuum cleaner	1 No.
12	Scanner	1 No.
13	Storage almiriah	As required