



MAHARASHTRA INSTITUTE OF TECHNOLOGY, AURANGABD
An Autonomous Institute Affiliated to Dr. Babasaheb
Ambedkar Marathwada University, Aurangabad,
Maharashtra (India)

Syllabus of Bachelor of Vocation

In

Food Processing

Under Choice Based Credit System (CBCS)

Under Faculty of Science and Technology

(Effective from 2022-23 and onwards)

Curriculum for B. Voc Food Processing

NSQF Level -5										Semester -I
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP101	Food Quality Analysis	3	3	-	10	15	25	50	1.5
2.	VFP102	Food Refrigeration and Supply Chain	3	3	-	10	15	25	50	1.5
3.	VFP103	Food Plant Sanitation	3	3	-	10	15	25	50	1.5
4.	VFP104	Food Plant Equipment	3	3	-	10	15	25	50	1.5
Lab/Practical										
5.	VFP121	Food Quality Analysis Laboratory	1.5	-	2	-	25	25	50	-
6.	VFP122	Food Refrigeration and Supply Chain Laboratory	1.5	-	2	-	25	25	50	-
On Job Training (OJT)/Qualification Packs*										
7.	VFP131	Assistant Lab Technician FIC/Q7601	15	-	7-8 weeks	--	50	150	200	-
	VFP132	Cold storage Technician FIC/Q7004								
	VFP133	Plant Biscuit Production Specialist FIC/Q5003								

*Any one On-Job-Training as per guidelines of AICTE & SSC for the given skill sets for 150 Marks External Assessment by NSDC/SSC

NSQF Level -5										Semester -II
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP151	Entrepreneurship Development	3	3	-	10	15	25	50	1.5
2.	VFP152	Bakery, Confectionery and snack products	3	3	-	10	15	25	50	1.5
3.	VFP153	Food Packaging Technology	3	3	-	10	15	25	50	1.5
4.	VFP154	Processing of Meat & poultry Products	3	3	-	10	15	25	50	1.5
Lab/Practical										
5.	VFP171	Bakery, Confectionery and snack products Laboratory	1.5	-	2	-	25	25	50	-
6.	VFP172	Food Packaging Technology Laboratory	1.5	-	2	-	25	25	50	-
On Job Training (OJT)/Qualification Packs*										
7.	VFP181	Baking Technician FIC/Q5005	15	-	7-8 weeks	--	50	150	200	-
	VFP182	Packing Machine Worker FIC/Q7002								
	VFP183	Food Products Packaging Technician FIC/Q7001								

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Curriculum for B. Voc Food Processing

NSQF Level -6										Semester -I
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP201	Food Process Technology-III	3	3	-	10	15	25	50	1.5
2.	VFP202	Energy conservation and management	3	3	-	10	15	25	50	1.5
3.	VFP203	Sensory Evaluation of Food	3	3	-	10	15	25	50	1.5
4.	VFP204	Food Plant Layout	3	3	-	10	15	25	50	1.5
Lab/Practical										
5.	VFP221	Food Processing Technology and Sensory Evaluation – Lab	1.5	-	2		25	25	50	-
6.	VFP222	Food Plant Layout- Lab	1.5	-	2		25	25	50	-
On Job Training (OJT)/Qualification Packs*										
7.	VFP231	Fruits and Vegetable Canning Technician FIC/Q0107	15	-	7-8 weeks	--	50	150	200	-
	VFP232	Fruit Pulp Processing Technician FIC/Q 0106								
	VFP233	Fruits and Vegetable Drying/Dehydration FIC/Q0105								


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NSQF Level -6										Semester -II
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP251	Fish and Poultry Processing	3	3	-	10	15	25	50	1.5
2.	VFP252	By Product Utilization	3	3	-	10	15	25	50	1.5
3.	VFP253	Marketing Management and Trade	3	3	-	10	15	25	50	1.5
4.	VFP254	Instrumentation and Process Control	3	3	-	10	15	25	50	1.5
Lab/Practical										
5.	VFP271	Fish and Poultry Processing –Lab	1.5	-	2	-	25	25	50	-
6.	VFP272	By-product Utilization-Lab	1.5	-	2	-	25	25	50	-
On Job Training (OJT)/Qualification Packs*										
7.	VFP281	Fish and Sea Food Processing Technician FIC/Q4001	15	-	7-8 weeks	--	50	150	200	-
	VFP282	Purchase Assistant Food and Agriculture FIC/Q7005								

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NSQF Level -7										Semester -I
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP301	Ice cream and Frozen Desserts	3	3	-	10	15	25	50	1.5
2.	VFP302	Traditional Indian Dairy Products	3	3	-	10	15	25	50	1.5
3.	VFP303	Food Quality, Safety and Certification	3	3	-	10	15	25	50	1.5
4.	VFP304	Financial Management and Cost Accounting	3	3	-	10	15	25	50	1.5
Lab/Practical										
5.	VFP321	Ice cream and Frozen Desserts –Lab	1.5	-	2	-	25	25	50	-
6.	VFP322	Traditional Indian Dairy Products–Lab	1.5	-	2	-	25	25	50	-
On Job Training (OJT)/Qualification Packs*										
7.	VFP331	Ice Cream Technician FIC/Q2004	15	-	7-8 weeks	--	50	150	200	-
	VFP332	Traditional Snack and savoury Maker FIC/Q8501								
	VFP333	Butter and Ghee Processing Operator FIC Q/2003								

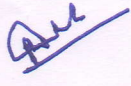
*Any one On-Job-Training as per guidelines of AICTE & SSC for the given skill sets for 150 Marks External Assessment by NSDC/SSC

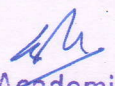
NSQF Level -7										Semester -II
Sr. No.	Course Code	Course Title	Credit	Contact Hr/Wk		Evaluation Scheme				ESE hour
				L	P	MSE	TA	ESE	Total	
Theory										
1.	VFP351	Project Preparation and Management	3	3	-	10	15	25	50	1.5
2.	VFP352	Entrepreneurship Development	3	3	-	10	15	25	50	1.5
Lab/Practical										
3.	VFP371	Project	9	-	4	-	100	100	200	-
On Job Training (OJT)/Qualification Packs*										
4.	VFP381	Production Manager FIC Q/9003	15	-	7-8 weeks	--	50	150	200	-
	VFP382	Processed Food Entrepreneur FIC/Q9001								
	VFP383	Multi Skill Technician FIC/Q9007								

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B.Voc. (Food Processing)

NSQF Level-5		VFP101: Food Quality Analysis		Semester-I	
Teaching Scheme			Examination Scheme		
Lectures	03Hrs./Week	MSE	10 Marks		
Practical	-	TA	15 Marks		
Credits	03	ESE	25 Marks		
		Duration of ESE	1.5 hours		
Course Outcomes (CO)					
Students will be able to					
1.	To provide students with the basic practical skills required to prepare foods, and evaluate raw and processed foods				
2.	To enable students to evaluate food establishments for their consumer acceptability and sanitation attributes				
Unit	Course Content				Hours
Unit 1	Basics of Food Science and Food Analysis, Concept, objectives and need of food quality.				(06)
Unit 2	Measurement of color, flavor, consistency, viscosity, texture and their relationship with food quality and composition				(05)
Unit 3	Sampling; purpose, sampling techniques, sampling procedures for liquid, powdered and granular materials, Sensory evaluation methods, panel selection methods, Interpretation of sensory Results. Instrumental method for testing quality.				(06)
Unit 4	Food adulteration and food safety. TQM and TQC, consumer references and acceptance, Food Safety Management Systems GAP, GHP, GMP, Hazards and HACCP (Hazard analysis and critical control point).				(06)
Unit 5	Sanitation in the food industry (SSOP), Food Laws and Regulations in India, FSSAI, Food grades and standards BIS, AGMARK, PFA, FPO, ISO 9000, 22000 Series. CAC (Codex Alimentarius Commission), Traceability and Quality Assurance system in a process plan Biosafety and Bioterrorism.				(07)
Text/Reference Books					
Sr. No.	Book	Author	Publisher		
1	A laboratory Manual of food Analysis	Sehgal S.2016	I.K. International publishing House Pvt.ltd		

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NSQF Level-5		VFP102: Food Refrigeration and Supply Chain		Semester-I	
Teaching Scheme			Examination Scheme		
Lectures	03 hrs/Week	MSE	10 Marks		
Practical	-	TA	15 Marks		
Total Credits	03	ESE	25 Marks		
		Duration of ESE	1.5 hours		
Course Outcomes (CO)					
Students will be able to					
1.	To study the fundamental reason for having a refrigerator is to keep food cold. Cold temperatures help food stay fresh longer.				
2.	To illustrate purpose of the Refrigeration & supply chain is to make product available to meet customer demand.				
Unit	Course Content				Hours
Unit 1	Principles of refrigeration: Definition, background with second law of thermodynamics, unit of refrigerating capacity, coefficient of performance; Production of low temperatures, reverse Carnot cycle Common refrigerants and their properties: classification, nomenclature, desirable properties of refrigerants- physical, chemical, safety, thermodynamic and economical.				(02)
Unit 2	Azeotropes; Components of vapour compression refrigeration system, evaporator, compressor, condenser and expansion valve; Ice manufacture, principles and systems of ice production, Treatment of water for making ice, brines, freezing tanks, ice cans, air agitation, quality of ice				(07)
Unit 3	Cold storage: Cold store, design of cold storage for different categories of food resources, size and shape, construction and material, insulation, vapour barriers, floors, frost-heave, interior finish and fitting, evaporators, automated cold stores, security of operations Refrigerated transport: Handling and distribution, cold chain, refrigerated product handling, order picking, refrigerated vans, refrigerated display.				(07)
Unit 4	Air-conditioning: Meaning, factors affecting comfort air-conditioning, classification, sensible heat factor, industrial air-conditioning, Problems on sensible heat factor; Winter/summer/year-round air-conditioning, unitary air-conditioning systems, central air-conditioning Problems on sensible heat factor; Winter/summer/year round air-conditioning, unitary air-conditioning systems, central air-conditioning.				(07)
Unit 5	Physiological principles in air-conditioning, air distribution and duct design method, Design of complete air-conditioning systems; humidifiers and dehumidifiers. Design of complete air-conditioning systems; humidifiers and dehumidifiers Managing cold Supply chain.				(07)

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Reference Book			
Sr. No.	Book	Author	Publisher
1	Refrigeration and Air Conditioning	W.F. Stoecker and J.W. Jones	McGraw-Hill Book Co., New York, USA. 1982 (2 nd edition)
2.	Refrigeration & Air Conditioning Technology	William C. Whitman, William	Delmar, Cengage Learning, NY, USA. 2017.
3.	Refrigeration and Air Conditioning	Arora RC	PHI Learning, New Delhi 2010

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B.Voc. (Food Processing)

NSQF Level-5		VFP103: Food Plant Sanitation		Semester-I	
Teaching Scheme			Examination Scheme		
Lectures	03 hrs/Week	MSE		10 Marks	
Practical	-	TA		15 Marks	
Total Credits	03	ESE		25 Marks	
		Duration of ESE		1.5 hours	
Course Outcomes (CO)					
Students will be able to					
1.	Understand desired manufacturing practices and guidelines for food industry.				
2.	Illustrate good practices of personal hygiene and sanitation in food industry.				
Unit	Course Content				Hours
Unit 1	Good manufacturing practices and current good manufacturing practices. Sanitation and the food industry: Sanitation, sanitation laws and regulations and guidelines, establishment of sanitary, potential risks of food borne bioterrorism, bioterrorism protection measures and role of pest management in bio-security.				(06)
Unit 2	Relationship of microorganisms to sanitation, Food contamination and protection against contamination. Personal hygiene and sanitary food handling: Role of HACCP in sanitation, quality assurance for sanitation cleaning compounds, handling and storage precautions. Sanitizers, sanitizing methods, sanitation equipment, waste product handling.				(06)
Unit 3	Pest control: Insect infestation, cockroaches, insect destruction, rodents, birds, use of pesticides and integrated pest management. Sanitary design and construction for food processing: Site selection, site preparation, building construction considerations, processing and design considerations and pest control design.				(06)
Unit 4	Low-moisture food manufacturing and storage sanitation: Sanitary construction considerations, receipt and storage of raw materials and cleaning of low-moisture food manufacturing plants.				(06)
Unit 5	Fruit and vegetable processing plant sanitation: Contamination sources, sanitary construction considerations, cleaning considerations, cleaning of processing plants, cleaners and sanitizers, cleaning procedures				(06)
Reference Book					
Sr. No.	Book	Author	Publisher		
1	Biotechnology and Food Processing Mechanics	Meenakshi Paul	Gene-Tech Books, New Delhi 2007		
2.	Biotechnology - Expanding Horizons	B.D. Singh	Kalyani Publishers, New Delhi. 2014.		

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B.Voc. (Food Processing)

NSQF Level-5		VFP104: Food plant Equipment		Semester-I	
Teaching Scheme			Examination Scheme		
Lectures	03 hrs/Week	MSE	10 Marks		
Practical	-	TA	15 Marks		
Total Credits	03	ESE	25 Marks		
		Duration of ESE	1.5 hours		
Course Outcomes (CO)					
Students will be able to					
1.	To understand concepts of plant layout.				
2.	To have knowledge on building, utilities in the plant.				
3.	To know the importance of proper food plant design and safety.				
Unit	Course Content				Hours
Unit 1	Introduction-Definition, Basic concepts of plant layout and design with Special reference to food process industries. Application of HACCP concept, ISO, FPO & MPO requirements in food plant layout and design.				(06)
Unit 2	Plant Location-Influence of location on plant layout, location factors, location theory and models, Economic plant size, types of manufacturing processes like continuous, repetitive and intermittent processes.				(06)
Unit 3	Plant Layout-Preparation of a Plant Layout, Plant Layout problem, importance, objectives, classical types of layouts. Evaluation of layout. Advantages of good Layout.				(06)
Unit 4	Plant Building-Considerations in building design, type of factory buildings, choice of building construction, material for floors, foundation, walls, doors, Windows, drains etc., ventilation, fly control, mold prevention and illumination in food processing industries.				(06)
Unit 5	Plant layout & Equipment Layout-Plant layout and design of bakery and biscuit industries; fruits and vegetables processing industries including Beverages; milk and milk products; meat, poultry and fish processing industries.				(06)
Sr. No.	Book	Author		Publisher	
1	Hygienic Design of food Factories	John Holah,	H.L.M Lelieveld,(2011)	Elsevier Publication.	
2.	Food Plant Designs	Antonio Lopez Gomez,	Gustav Canovas,(2005)	CRC Press Publication	
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B.Voc. (Food Processing)

NSQF Level -5		VFP121: Food Quality Analysis Lab		Semester-I	
Teaching Scheme		Examination Scheme			
Practical	Hours/week	TA		25 Marks	
Credits	1.5	ESE/PE		25 Marks	
Sr.No.	List of Experiments				
1	Estimation of Reducing and Non-Reducing Sugars in Honey by Lane Eynon Method.				
2	Estimation of Proteins in food using the Biuret Method				
3	Saponification, Iodine, and Acid Value of Edible Oils – fresh, stale and packed foods.				
4	Estimation of Lactose in Milk				
5	Estimation of Ascorbic Acid in Foods				
6	Estimation of Beta-Carotene in Foods				
7	Estimation of Calcium, Phosphorous and Iron content of Foods				
8	Estimation of Calcium, Phosphorous and Iron content of Foods				
9	Estimation of Anti-Nutritional Factors in Foods				
10	Study of sampling techniques from food processing establishments.				

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NSQF Level-5		VFP122: Food Refrigeration and Supply Chain Lab		Semester-I	
Teaching Scheme			Examination Scheme		
Practical	2 Hours/week		TA	25 Marks	
Credits	1.5		ESE/PE	25 Marks	
Sr.No.	List of Experiments				
1	Study of vapour compression refrigeration system				
2	Determination of COP of vapour compression refrigeration system				
3	Study of various types of compressors and condensers used in refrigeration system				
4	Study of various types of evaporative coils and expansion valves used in refrigeration system				
5	Study of refrigerants, their properties and charts				
6	Estimation of refrigeration load for meat and poultry producer				
7	Study of refrigeration system for dairy plant				
8	Study of refrigeration system of dairy plant; Estimation of refrigeration load for ice-cream				
9	To study of cold supply chain and explain their types of cold supply chain				
10	To explain the cold supply chain their component and process of supply chain with their importance.				

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B.Voc. (Food Processing)

NSQF Level -5		On Job Training/Qualification Packs*		Semester-I	
Teaching Scheme				Examination Scheme	
Practical	7-8 weeks			TA	50 Marks
Credits	15			ESE/PE	150 Marks
VFP131	Assistant Lab Technician FIC/Q7601				
VFP132	Cold Storage Technician FIC/Q7004				
VFP133	Plant Biscuit Production Specialist FIC/Q5003				
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B.Voc. (Food Processing)

NSQF Level-5		VFP151: Entrepreneurship Development		Semester-II	
Teaching Scheme			Examination Scheme		
Lectures	03 hrs/Week		MSE	10 Marks	
Practical	-		TA	15 Marks	
Total Credits	03		ESE	25 Marks	
			Duration of ESE	1.5 hours	
Course Outcomes (CO)					
Students will be able to					
1.	To know about the various procedures for starting a small scale unit of production.				
2.	To have a basic idea about how to prepare a project to start a small scale Industry.				
3.	To know about various agencies that can provide assistance for starting a new Project.				
Unit	Course Content				Hours
Unit 1	Entrepreneurship: Importance and growth, characteristics and qualities of entrepreneur, role of entrepreneurship, ethics and social responsibilities; Entrepreneurship development, Assessing overall business environment in the Indian economy; Overview of Indian social, political and economic systems and their implications for decision making by individual entrepreneurs;				(06)
Unit 2	Globalization and the emerging business/entrepreneurial environment; Concept of entrepreneurship, entrepreneurial and managerial characteristics, managing an enterprise, motivation and entrepreneurship development, importance of planning, monitoring, evaluation and follow up, managing competition.				(06)
Unit 3	Entrepreneurship development programs, SWOT analysis, generation, incubation and commercialization of ideas and innovations; Women entrepreneurship: Role and importance, problems; Corporate entrepreneurship: Role, mobility of entrepreneur.				(06)
Unit 4	Entrepreneurial motivation; Planning and evaluation of projects: Growth of firm, project identification and selection, factors inducing growth; Project feasibility study: Post planning of project, project planning and control; New venture management; Creativity.				(06)
Unit 5	Government schemes and incentives for promotion of entrepreneurship; Government policy on small and medium enterprises (SMEs)/SSIs; Export and import policies relevant to food processing sector; Venture capital; Contract farming and joint ventures, public-private partnerships; Overview of food industry inputs; Characteristics of Indian food processing industries and export; Social responsibility of business.				(06)
Sr. No.	Book	Author	Publisher		
1	Entrepreneurship Development	C.B. Gupta	S. Chand & Sons, New Delhi.		

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		and N.P. Srinivasan	2012
2.	Entrepreneurship Development	Anil Kumar, S., Poornima, S.C., Mini, K., Abraham	New Age International Publishers, New Delhi. 2003
3.	Management: Theory and Practice	Jayashree, K Gupta, C.B.	Sultan Chand & Sons, New Delhi. 2001

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B.Voc. (Food Processing Technology)

NSQF Level-5		VFP152: Bakery, Confectionery and Snack products		Semester-II	
Teaching Scheme		Examination Scheme			
Lectures	03 hrs/Week	MSE	10 Marks		
Practical	-	TA	15 Marks		
Total Credits	03	ESE	25 Marks		
		Duration of ESE	1.5 hours		
Course Outcomes (CO)					
Students will be able to					
1.	To develop skills of the student related to Bakery confectionery.				
2.	The student will gain an understanding of processing techniques utilized in the bakery and confectionery industry				
3.	To acquaint students with the principals involved in the manufacture of commercial snack foods.				
Unit	Course Content				Hours
Unit 1	Manufacturing of sugar:- Sugarcane, jiggery, khandasari sugar, raw sugar, refined sugar, white sugar, beet sugar, manufacture of sugar from sugar cane, refining of sugar. Classification of confectionery-Sugar boiled confectionery crystalline and amorphous confectionery, rock candy, hard candy, lemon drop, china balls, soft candy, lollypop, marshmallows, fudge, cream, caramel, toffee, lozenges, gumdrops, honeycomb candy.				(06)
Unit 2	Properties of wheat:-Wheat – Properties, Quality – Hardness, Gluten strength, protein content, soundness. Methodology and approaches to evaluate bread and bread –Wheat quality –processing factors, product factors, Principles of baking and Bread manufacturing:-Major baking ingredients and their functions, role of baking ingredients in improving the quality of bread.				(06)
Unit 3	Cake and Biscuit manufacturing:-Processing of cakes and biscuits-ingredients, development of batter, baking and packing, Spoilage in cakes and biscuits. Ingredients, dough development methods - straight dough, sponge dough, moulding, proofing, baking, packing, spoilage, bread staling, methods to reduce bread staling and spoilage.				(06)
Unit 4	Grain-based snacks- Technology for Whole Grains Snacks – roasted, toasted, puffed, popped, flaked ,Technology for Coated Grain Snacks – salted, spiced, sweetened ,Technology for Batter-Based and Dough-Based Products ,Technology for Formulated, Products – chips, wafers, papads, instant pre-mixes.				(06)
Unit 5	Horticulture produce-based snacks -Technology for Fruit-Based Snacks, Technology for Vegetable-Based Snacks, Technology for Coated Nuts. Extruded snacks-Formulation and Processing Technology, Coloring and Flavoring, Packaging Machinery and Equipment, Use, and Care.				(06)

Sr. No.	Book	Author	Publisher
1	Bakery products and science technology	Zhou.W,HuiY,H:(2014),	Wiley Blackwell Publishers
2.	Baking science & Technology	Pyler.E.J.andGo rton,L.A (2009)	Sosland publication
3.	Snacks food*	Gordon B.R.1997	

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B.Voc. (Food Processing)

NSQF Level-5		VFP153: Food Packaging Technology		Semester-II	
Teaching Scheme		Examination Scheme			
Lectures	03 hrs/Week	MSE	10 Marks		
Practical	-	TA	15 Marks		
Total Credits	03	ESE	25 Marks		
		Duration of ESE	1.5 hours		
Course Outcomes (CO)					
Students will be able to					
1.	To know the Novel Food Technology, function of packaging, types of packaging.				
2.	To get aware about the packaging materials				
3.	To understand properties of packaging materials their methods of testing and evaluation				
Unit	Course Content				Hours
Unit 1	Novel Food Packaging Technology:-I: Novel Food Packaging Technology 12 Periods Introduction to principles of Food Packaging, Functions of packaging , Types of Package. Packaging materials, Desirable properties of Packaging Materials, Selection of packaging material for different foods.				(06)
Unit 2	Methods of packaging and packaging equipment's:-Different forms of packaging such as Rigid, Semi rigid, Flexible forms. Properties of packaging materials their methods of testing and evaluation; Barrier properties of packaging materials: Permeability, Gas transmission rate (GTR), Water vapor transmission rate (WVTR) and their measurement.				(06)
Unit 3	Glass:- Glass: composition, properties, types of closures, methods of bottle making; Metals: Tinsplate containers, tinning process, components of tinsplate, tin free steel (TFS), types of cans, Aluminum containers, lacquers. Biodegradable and edible packaging, aseptic packaging-need, advantages, process, comparison of conventional & aseptic packaging. system of aseptic packaging and materials used in aseptic packaging machineries used in packing foods				(06)
Unit 4	Plastics: - Plastics: types of plastic films, laminated plastic materials, co extrusion, edible films, biodegradable plastics. Active and Intelligent packaging techniques: Concept, techniques and uses in Food Industry, Current use of novel packaging techniques, Consumers and novel packaging.				(06)
Unit 5	Scavengers:- Periods Oxygen, ethylene Carbon dioxide and other scavengers: Scavenging technology, and its applications. Different packaging system for different foods, Prediction of Shelf Life of foods. Permeability – theoretical consideration permeability of gases and vapor's, permeability of multilayer packages, permeability in relation to products.				(06)

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Sr. No.	Book	Author	Publisher
1	Food Packaging Academic press.	Kadoya T(ED).1990	
2.	Principal of food packaging.	Sacharow S & Griffin RC.1980.	AVI Publication
3.	Development of food Packaging.	Palling SJ.(ED).1980	App.Sci. publication

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B.Voc. (Food Processing Technology)

NSQF Level-5		VFP154: Processing of meat & poultry products		Semester-II	
Teaching Scheme			Examination Scheme		
Lectures	03 hrs/Week		MSE	10 Marks	
Practical	-		TA	15 Marks	
Total Credits	03		ESE	25 Marks	
			Duration of ESE	1.5 hours	
Course Outcomes (CO)					
Students will be able to					
1.	To acquaint students with types and grades of meat, poultry, and sea foods,				
2.	To familiarize students with processing techniques used for the production of commercial meat, poultry, and sea foods				
Unit	Course Content				Hours
Unit 1	Sources and importance of meat and poultry; Status of Meat and poultry industry in India; Pre slaughter operations and slaughtering operations for animals and poultry; Evaluation of animal carcasses; Factors affecting post-mortem changes, properties and shelf life of meat; Mechanical deboning, grading and aging; Eating and cooking quality of meat.				(06)
Unit 2	Preservation of meat by chilling, freezing, pickling, curing, cooking and smoking, Dehydration, radiation, chemical and biological preservatives. Meat tenderization; Meat emulsions; Meat cutting and handling; Preparation, preservation and equipment for manufacture of smoked meat and its quality evaluation; Preparation, packaging and equipment for manufacture of dehydrated meat products and their quality evaluation.				(06)
Unit 3	Preparation, packaging and equipment for manufacture of dehydrated meat products And their quality evaluation; Factors affecting post-mortem changes, properties and shelf life of meat, Preparation, preservation and equipment for manufacture of meat sausages and their quality evaluation; Abattoir design and layout.				(06)
Unit 4	Sources and importance of poultry; Status of poultry industry in India; Pre slaughter operations and slaughtering operations for poultry; Eggs: Structure, composition, quality characteristics, Meat tenderization. – Principles and methods.				(06)
Unit 5	Processing, preservation of eggs; Processing and preservation of poultry meat and chicken patties; By-products of poultry and eggs and their utilization. Safety standards in meat industry: HACCP/ ISO/ MFPO/ FSSAI/ Kosher/ Halal. Processing and preservation of meat- mechanical deboning, aging or chilling, freezing, pickling. Curing, cooking and smoking of meat.				(06)

Sr. No.	Book	Author	Publisher
1	Handbook of meat processing	Fidel Toldra (2010),	John Wiley & Sons Publication.
2.	"Poultry meat processing"	Casey M. Owens. (2010),	CRS PRESS
3.	Principles of Meat Technology	Singh V. P.	New India Publishing Agency, Delhi ISBN: 9789380235554

Sr. No.	Practical	Credits	Hours/week	Marks
1	Tests for the Rheological Properties of Dough	1.5	2	25
2	Preparation of Advanced Bakery Products - scones, doughnuts, doughnuts	1.5	2	25
3	Preparation of Filled and Iced Cakes	1.5	2	25
4	Preparation of Chocolate, Preparation of Coated Confectionery	1.5	2	25
5	Quality Evaluation of the Bakery Products: Filled and Iced Cakes, Chocolate and Coated Confectionery	1.5	2	25
6	Determination of Nutritional Value of Bakery and Confectionery Products	1.5	2	25
7	Preparation of Snack Foods based on Cereals, pulses, nuts	1.5	2	25
8	Development of Instant Food Pre-Mixes	1.5	2	25
9	Determination of Shelf-Life and Quality Characteristics of Snack Foods	1.5	2	25
10	Visit to Bakery	1.5	2	25

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Maharashtra Institute of Technology, Aurangabad.			
(An Autonomous Institute)			
B.Voc. (Food Processing)			
NSQF Level-5		VFP171: Bakery, Confectionery and Snack products	
Semester-II			
Teaching Scheme		Examination Scheme	
Practical	2 Hours/week	TA	25 Marks
Credits	1.5	PE	25 Marks
List of Experiments			
Sr.No.			
1	Tests for the Rheological Properties of Dough		
2	Preparation of Advanced Bakery Products – sourdoughs, pastries, croissants, doughnuts		
3	Preparation of Filled and Iced Cakes		
4	Preparation of Chocolate, Preparation of Coated Confectionery		
5	Quality Evaluation of the Bakery Products, Filled and Iced Cakes, Chocolate, and Coated Confectionery		
6	Determination of Nutritional Value of Bakery and Confectionery Products		
7	Preparation of Snack Foods based on Cereals, pulses, nuts.		
8	Development of Instant Food Pre-Mixes		
9	Determination of Shelf-Life and Quality Characteristics of Snack Foods		
10	Visit to Bakery		

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B.Voc. (Food Processing)

NSQF Level-5		VFP172: Food Packaging Technology -Lab		Semester-II	
Teaching Scheme			Examination Scheme		
Practical	2 Hours/week		TA	25 Marks	
Credits	1.5		PE	25 Marks	
Sr.No.	List of Experiments				
1	Identification and testing of packaging materials				
2	Determination of tensile strength of given packaging material				
3	Determining water absorption capacity of packaging material				
4	Determining bursting strength of packaging material				
5	Determining tearing strength of packaging material				
6	To perform vacuum packaging of food sample and carry out its storage study				
7	Testing of lacquered tin plate sheets				
8	Determination of water vapor transmission rate of package films				
9	Pre-packaging practices followed for packaging fruits and vegetables				
10	Packaging and labelling of the product-packaging design, graphics, labelling				

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B.Voc. (Food Processing Technology)

NSQF Level -5		On Job Training/Qualification Packs*		Semester-II	
Teaching Scheme				Examination Scheme	
Practical	7-8 weeks			TA	100 Marks
Credits	15			PE	100 Marks
VFP181	Baking Technician FIC/Q5005				
VFP182	Packaging Machine Worker FIC/Q7002				
*Any one On-Job-Training as per guidelines of AICTE & SSC for the given skill sets for 150 Marks External Assessment by NSDC/SSC					

2	Determining tearing strength of packaging material
4	To perform vacuum packaging of food sample and carry out its storage study
7	Testing of lacquered tin plate sheets
8	Determination of water vapor transmission rate of package films
9	Pre-packaging practices followed for packaging fruits and vegetables
10	Packaging and labelling of the product: packaging design, graphics, labelling

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