



*Progressive Education Society's*

**Modern College of Arts, Science and  
Commerce**

**Ganeshkhind, Pune - 411 016**

**(Autonomous)**

Syllabus for

**T. Y. B. Voc. Food  
Processing Technology**

## **Introduction:**

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college education, leading to Bachelor of Vocation (B. Voc.) degree with multiple exits such as Diploma/Advanced Diploma under the National Skill Qualification framework (NSQF). The B. Voc. Programme is focused on providing undergraduate studies which would also incorporate specific jobs and their NOSs (National Occupational standards) along with broad based general education. This would enable the graduates completing B. Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

Under National Skills Development Corporation, many Sector Skill Council representing respective industries have/are being established. One of the mandates of Sector Skill Councils is to develop National Occupational Standards (NOSs) for various jobs in their respective industries. It is important to embed the competencies required for specific jobs roles in the higher education system for creating employable graduates.

This course will identify and fill the skill gaps. The mandate of this program is to create a course with industry-academia collaboration that will produce skilled workforce satisfying specific needs of the industry. This course will offer multiple needs of the industry. The structure will allow offer multiple needs of the industry. The structure will allow students to have thorough theoretical knowledge coupled with rigorous hands on training in both laboratory and industry.

#### Unique Features of the Course:

- The skill development component is to equip students with appropriate knowledge, practice and attitude, so they are ready to work.
- The skill development components will be relevant to the industries as per their requirements.
- The curriculum is embed with National Occupational Standards (NOSs) of specific job roles within the industry sector(s).
- The overall design of the skill development component along with technologies in food process engineering.
- The curriculum should also focus on work-readiness skills in each of the three years. Curriculum should also focus on work-readiness skills in each of the three years. Curriculum is designed to match industrial needs with greater emphasis on practical work, on the job training and industrial internship.

#### **Program Objectives:**

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are ready to work at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.

#### **Program Specific Outcomes (PSOs):**

##### **Program Outcomes:**

After successful completion of B.Voc (Food Processing Technology) program, the students should be able:

PO1: to have competencies in the area of basic and applied food processing technology.

PO2: to explore and have in depth knowledge of all food processing technology related sectors.

PO3: to set up their own processing unit or should engage in research.

PO4: to develop new products.

### **Program-specific / Course outcomes**

#### **Course Outcomes for FPT 25: Bakery And Confectionary Processing (4 Credits)**

CO1: Students will understand the basic terms and concepts related to bakery and confectionary products.

CO2: Students will gain the knowledge related to various machineries used in

bakery.CO3: Learn the role of different ingredients in bakery products.

Co4: To know the manufacturing details of bakery and confectionary products

Co5: Learn about the different parameters for setting up bakery unit.

Co6: Understand cost components like fixed cost and learn how to do the costing of the product

#### **Course Outcomes for FPT 26: New Product Development (4 Credits)**

CO1: Students will understand the concept of new product development, type of new product and need of new product development.

CO2: They will learn different objectives of creative product and innovative products, different stages involved in new product development like idea generation, idea screening, business analysis, product development and commercialization.

CO3: They will get knowledge about ingredients used for product development, quality and quantity of ingredients, cost of ingredients, nutritional composition of new product like (carbohydrates, protein, fat, minerals, fibers), standard specification as per laws and regulations for ingredients.

CO4: They will understand about sensory evaluation, need and importance of sensory

evaluation, methods of sensory evaluations, type of sensory evaluation, selection of panelist, result of sensory evaluation.

CO5: They will get the knowledge about product design and process development for the new product development, steps involved in product design, factors affecting on the product design, selection of prototype for product development.

CO6: will understand about the market strategy, selection of market for product launching, consumer testing by market survey.

CO7: They will learn the shelf life study of new product by using different test like physical, chemical and microbiological test of product, successful market testing and commercialization of new product in India.

### **Course Outcomes for FPT 27: Waste Management and Food Storage and Warehouse Technology (4 Credits)**

CO1: Students will get introduction to waste produced in food industry and its management methods.

CO2: They will acquire knowledge regarding treatment methods for liquid waste treatment.

CO3: They will acquire knowledge about bio filters and ion exchange treatment of drinking water.

CO4: They will learn the methods for recovery of biological materials from different food processing industry.

CO5: Student will learn about food storage, economics. Warehouse design and construction and material used for warehouse construction

CO6: They will understand types of storage and respective warehouse designs.

CO7: They will learn the Principles of supply chain management, documentation and management of warehouse contents.

### **Course Outcomes for FPT 28: Practical on Bakery and Confectionary (6 Credits)**

CO1: Students will learn to prepare different types of bread like whole wheat bread, white bread & understand the changes occur during baking.

CO2: Learn to prepare other baked products like pizza base, bread sticks.

CO3: Learn to prepare flour confectionary product like sponge cake, swiss roll.CO4: Understand preparation technique for icing.

CO5: Learn to prepare skill based products like puff pastry.

CO6: Understand working of different equipment used in

bakery.CO7: Understand working of different types of ovens.

### **Course Outcomes for FPT 29: Practical on New Product Development (6 Credits)**

CO1: Students will understand the how to generate new product ideas, product concept and product design. They will learn preparation of new product by using different processing methods.

CO2: They will learn ingredients technology, limits of ingredients, benefits of ingredients, preparation of new product having a good nutritional value.

CO3: They will understand the prototype development, specification of products, and standard procedure for new product development.

CO4: They will acquire knowledge about sensory evaluation, type of sensory evaluation, use of sensory evaluation, and sensory evaluation of processed product.

CO5: They will learn shelf life study of new product, test of quality parameters, and physical, chemical and microbiological test of product.

### **Course Outcomes for FPT 30: Industry Training (6 Credits)**

CO1: Students will learn about how to search research articles and reviews related to particular food products.

CO2: They will learn how to implement their ideas in innovative product development.

CO3: They will understand the process of product standardization.

CO4: They will learn the quality control of products.

CO5: They will learn about cost estimation, sales and marketing of food products.

CO6: They will learn about maintenance of different equipment's and their standardization.

CO7: They will understand about different food laws, different certifications required for food industry.

CO8: They will learn about how auditing and accreditation is carried out.

CO9: They will acquire knowledge about packaging material testing and their use in different food products.

CO10: will learn about nutritional labeling of food products.

CO11: They will understand how to maintain data and carry out statistical analysis of food products.

#### **Course Outcomes for FPT 31: Meat, Fish and Poultry Technology (4 Credits)**

CO1: Students will understand the basic of meat, fish and poultry processing and importance of meat processing for entrepreneurship development.

CO 2: They will learn different meat processing and preservation methods.

CO3: They will understand about principles of fish processing and different fish processing methods.

CO4: They will get the knowledge about different quality parameters of fish suitable for processing.

CO5: They will understand different methods of poultry processing and quality parameters of poultry.

CO6: They will learn importance of egg production and different egg preservation methods such as pickling and canning.

#### **Course Outcomes for FPT 32: Entrepreneurship Development and Business Management (4 Credits)**

CO1: Students will get introduction to management author's and their contribution. CO2: They will acquire knowledge regarding functions of management in detail.

CO3: They will acquire knowledge about various leadership style and motivational techniques used in an organization. They will be aware about sexual harassment

CO4: Students will understand the basic concepts of Entrepreneurship, and Need for entrepreneurship.

CO5: They will understand the Proprietary, Partnership and Group Entrepreneurship.

CO6: They learnt about the entrepreneurs in shadows, failed entrepreneurship, new internet entrepreneurs.

CO7: They learnt about the entrepreneurial values and attitudes, entrepreneurial qualities, role demands, requirements of entrepreneurs and barriers to entrepreneurship.

### **Course Outcomes for FPT 33: Food Laws and Regulation (4 Credits)**

CO1: Student will learn the need for food standards and their enforcement

CO2: They will learn Various types of laws- Mandatory/Regulatory and Voluntary/Optional

CO3: They will learn various food laws (Mandatory) - Food Safety and Standards Act, 2006 (FSSA), Edible Oils Packaging (Regulation) Order etc.

CO4: They will learn Voluntary/Optional-Agmark Standards (AGMARK), Codex Alimentarius Standards, BIS Standards and Specifications, Consumer Protection Act, 1986.

CO5: Establishment of Food Safety and Standards Authority of India (FSSAI) (II) and functions of the chairperson and other members of FSSAI

CO6: Student will learn the establishment and Functions of Central Advisory Committee, Scientific Panels, Scientific Committees. Duties and functions of Food Authority

### **Course Outcomes for FPT 34: Practical on Meat, Fish and Poultry Technology (6 Credits)**

CO1: Students will understand the survey of different meat processing industries and different processed products from meat, fish and poultry.

CO2: They will understand the slaughtering process and cleaning and sanitation of meat



andmeat plant.

CO3: They will acquire the knowledge about different preservation methods such as canning and pickling.

CO4: They will acquire the knowledge about how to check quality of fish for processing.

CO5: They will understand how to produce fishmeal protein and fishmeal powder.

They will understand the processing of chicken and test

quality. CO6: They will learn the process of canned egg pickle.

### **Course Outcomes for FPT 35: Practical on Entrepreneurship Development (6 Credits)**

CO1: Students will understand the basic concepts of Entrepreneurship, and Need for entrepreneurship.

CO2: They will understand the Proprietary, Partnership and Group Entrepreneurship.

CO3: They will understand the exploring the world of entrepreneurs.

CO4: They learnt about the entrepreneurs in shadows, failed entrepreneurship, new internet entrepreneurs.

CO5: They learnt about the entrepreneurial values and attitudes, entrepreneurial qualities, role demands, requirements of entrepreneurs and barriers to entrepreneurship.

### **Course Outcomes for FPT 36: Project (6 Credits)**

CO1: Students will learn about how to search research articles and reviews related to particular food products.

CO2: They will learn how to implement their ideas in innovative product development.

CO3: They will understand the process of product standardization.

CO4: They will acquire knowledge about sensory evaluation methods used in industry.

CO5: They will learn about cost estimation, sales and marketing of food products.

CO6: They will learn about maintenance of different equipment's and their standardization.

CO7: They will understand about different food laws, different certifications required for food industry.

### **Examination Pattern:**

50:50 [Continuous Internal Evaluation: Formative, Summative and End semester exam (ESE)]

Evaluation of Students:

- 1) The Internal evaluation will be in form of continuous assessment format of 50 marks and End-Semester examinations will be of 50 marks making total to 100 (4CREDIT).
- 2) The Internal evaluation will be in form of continuous assessment format of 75 marks and End-Semester examinations will be of 75 marks making total to 150 (6 CREDIT).
- 2) Student has to obtain 30% marks in the examination of In-Semester and End-Semester assessment. Separate passing is mandatory and total passing marks is 40%.

In-semester Examination: Internal assessment for each course would be continuous and dates for each tutorials/practical tests etc. will be pre-notified in the time table for teaching or placed separately as a part of time table. Department/ College Internal Assessment Committee will coordinate this activity.

### **Suggested internal assessment tools for courses:**

The concerned teacher shall announce the units for which internal assessment will take place. A teacher may choose one of the methods given below for the assessment.

1. Short Quizzes / MCQ Test
2. Term Paper
3. Lecture/ Library Notes
4. Home Assignments
5. Group Discussion
6. Open Book Test
7. Written Test
8. PPT presentation
9. Viva

### Teaching Methodology:

1. Classroom Teaching
2. Guest Lectures
3. Group Discussions
4. Surveys
5. Power Point Presentations
6. Visit to Institutions / Industries
7. E-content

## Subject List

### SEMESTER V

Subject Code	Name of the Subject	TH/PR	Credits	Contact Hr.
FPT25	Bakery and Confectionery Technology	TH	4	60
FPT26	Waste Management and warehouse Technology in food Industry	TH	4	60
FPT27	New Product Development and Formulation	TH	4	60
FPT28	Practical on Bakery and Confectionery Technology	PR	6	90
FPT29	Practical on New Product Development and Formulation	PR	6	90
FPT30	Industry Internship and Research	PR	6	90
<b>Total</b>			<b>30</b>	<b>450</b>

**SEMESTER VI**

<b>Subject Code</b>	<b>Name of the Subject</b>	<b>TH/PR</b>	<b>Credits</b>	<b>Contact Hrs.</b>
FPT31	Meat, Fish And Poultry Processing	TH	4	60
FPT32	Management and Entrepreneurship Development	TH	4	60
FPT33	Food Laws and Regulation	TH	4	60
FPT34	Practical on Meat Fish and Poultry Processing	PR	6	90
FPT 35	Practical on Entrepreneurship Development	PR	6	90
FPT 36	Project	PR	6	90
<b>Total</b>			<b>30</b>	<b>450</b>

# Syllabus

**Subject Code:** FPT 25

**Subject:** Bakery And Confectionary Technology (4 credits)

**Total Lectures=60**

Sr.No	TOPICS	Lectures (60 L)
1.	<p><b>Unit 1: Introduction to bakery and confectionery</b></p> <ul style="list-style-type: none"> <li>• Scope of bakery, Organizational structure, Units of measurements, Bakery terms,</li> <li>• Small and large equipment used in bakery and confectionery, Baking temperatures for bread and confectionery.</li> </ul> <p><b>Hygiene and Sanitation in Bakery Industry:</b></p> <ul style="list-style-type: none"> <li>• Concept of hygiene and its importance in bakery,</li> <li>• Personal hygiene,</li> <li>• Work area hygiene</li> </ul>	4
2.	<p><b>Unit 2: Bakery Materials and Products</b></p> <ul style="list-style-type: none"> <li>• Wheat – importance, production varieties used for cultivation,</li> <li>• Structure of wheat grain, and characteristics of wheat,</li> <li>• Types of wheat, grading and quality of wheat, gluten</li> </ul> <p><b>Milling :</b></p> <ul style="list-style-type: none"> <li>• Milling of wheat: Rolling flour milling process; break rolls; reduction rolls; Design and operation,</li> <li>• Wheat milling process</li> </ul>	8
3.	<p><b>Unit 3: Baking:</b></p> <ul style="list-style-type: none"> <li>• Simple tests for flour quality, colour, gluten and water absorption power.</li> <li>• Characteristics of different flours and their suitability for use in different types of baked products.</li> </ul>	10

	<ul style="list-style-type: none"> <li>Flour improvers.</li> </ul> <p><b>Enriched Bakery Products:</b></p> <ul style="list-style-type: none"> <li>Bakery goods with soya flour, ground-nut flour, whole wheat meal.</li> <li>Flour additives, flour improvers, Bleaching, Oxidizing agents</li> <li>Products from hard wheat: dough methods role of each ingredient</li> </ul>	
4.	<p><b>Unit 4: Bread and Biscuits</b></p> <ul style="list-style-type: none"> <li>Introduction to Role of Raw material used for Bread Making</li> <li><b>Essential ingredients:</b> Flour, Salt, Yeast, Water, Sugar</li> <li><b>Optional ingredients:</b> Fats and Oils, Eggs, Bread Improvers, Milk</li> <li><b>Characteristics of good bread:</b> bread processes of bread making using straight and sponge,</li> <li>External and internal characteristics of bread, Defects in bread</li> <li>Baked product from soft wheat; cookies, crackers, biscuits- Role of Raw materials, methods</li> </ul>	14
5.	<p><b>Unit 5: Confectionary: Introduction to confectionery</b></p> <ul style="list-style-type: none"> <li>Scope of confectionery</li> <li>Confectionary terms.</li> <li>Role of raw material required for confectionery</li> </ul>	6
	<ul style="list-style-type: none"> <li><b>Moistening agents:</b> Milk, Egg, Water, colours and flavours.</li> <li><b>Leavening agents:</b> Chemical, natural, water vapors and biological</li> </ul>	
	<p><b>Cakes –</b></p> <ul style="list-style-type: none"> <li>Introduction to Role of Raw material used for cake</li> <li>Ingredients and its function,</li> </ul> <p><b>Cake making methods:</b></p> <ul style="list-style-type: none"> <li>Sugar batter method,</li> <li>Flour batter method Blending,</li> <li>Genoise/ sponge method,</li> <li>All in one method</li> </ul> <p>Cake faults and remedies.</p> <p><b>Pastry making:</b> Stages in sugar cookery, Fondants and chocolate work, Marzipans, Icings and cream fillings. balancing,</p> <p><b>Other bakery products:</b> using very hard wheat. pizza, pastry and its types.</p>	3
6	<p><b>Unit 6: Chocolate processing:</b> Ingredients, stages of mixing, fat bloom.</p> <p><b>High Boiled Sweets:</b></p> <ul style="list-style-type: none"> <li>Introduction and composition,</li> <li>properties of high boiled sweets,</li> <li>Different types of higher boiled sweets, recipes.</li> </ul>	7

	<p><b>Toffee:</b> definition, composition, types of toffee ingredient and their role.</p> <p><b>Fondant:</b> fudge/creamy: ingredients, methods Starch derivatives, colours used in confectionary. Production of glucose syrup</p>	
7	<p><b>Unit 7: Equipment, Maintenance and Service :</b></p> <ul style="list-style-type: none"> <li>• <b>Types of oven used in Bakery and Confectionery</b></li> <li>• <b>Electric oven:</b> OTG, microwave, rotary, single deck, double deck, pizza oven,</li> <li>• <b>Non electric oven:</b> Diesel oven, gas oven , brick oven</li> </ul>	6

**REFERENCE BOOKS:**

1. Bakery Science and Cereal Technology Khetarpaul. And Daya Books, New Delhi 2005
2. Technology of Cereals Kent. Woodhead Publishing, 1994
3. Flour Milling Process Scott JH Chapman & Hall, 1951
4. Bakery Products Science and Technology Zhou and Hui John Wiley and Sons, 2014

**Subject Code** FPT 26

**Subject : New Product Development** (4 Credit)

**Total Lectures=60**

<b>Sr. No</b>	<b>TOPICS</b>	<b>Lectures (60P )</b>
1.	Introduction and overview: Definition's, Product, NPD, Innovation creation. Need of NPD, Categories of NPD	6
2	Phases of NPD: Idea generation, Concept Development, Marketing strategy development, Business analysis, Product development, Marketing, Commercialization.	8
3	Product design and process development: Introduction, Design process, Steps in product design and process development. Product testing, Product formulation, Packaging development.	8
4	Prototype Development	6
5	Sensory Evaluation of Food: Sensory attribute of food quality and its characteristics, Requirements to conduct sensory evaluation- sensory panel, presenting samples for testing and panel booth. Types of sensory tests.	8
6	Test Marketing/Consumer testing: Test Market strategies.	8
7	Shelf life study of product: Factors affecting on shelf stability of food, Physical measurements, chemical measurement, microbial measurement and sensory evaluation.	8
8.	Case Studies- Recent Trends, Updates, New Products, Processes, Packaging	8

**References:**

1. Lyon, D.H.; Francombe, M.A.; Hasdell, T.A.; Lawson, K. (eds) (1992): Guidelines for Sensory Analysis in Food Product Development and Quality Control. Chapman and Hall, London.
2. Amerine, M.A.; Pangborn, R.M.; Roessler, E.B. (1965): Principles of Sensory Evaluation. Academic Press, New York.
3. Kapsalis, J.G. (1987): Objective Methods in Food Quality Assessment. CRC Press, Florida.
4. Martens, M.; Dalen, G.A.; Russwurm, H. (eds) (1987): Flavour Science and Technology. John Wiley and Sons, Chichester.
5. Moskowitz, H.R. (eds) (1987): Food Texture: Instrumental and Sensory Measurement. Marcel Dekker Inc. New York.
6. Lawless, H.T. and Klein, B.P. (1991): Sensory Science Theory and Applications in Foods.



Marcel Dekker Inc.

7. Jellinek, G. (1985): Sensory Evaluation of Food Theory and Practice. Ellis Horwood, Chichester.
8. Piggott, J.R. (ed) (1988): Sensory Analysis of Foods. Elsevier Applied Science, London.
9. Meilgaard, M.; Civille, G.V.; Carr, B.T. (1987): Sensory Evaluation Techniques, Vols. I and II, CRC Press, Florida.
10. Moskowitz, H.R. (1983): Product Testing and Sensory Evaluation of Foods: Marketing and R & D approaches. Food and Nutrition Press, Connecticut.
11. Moskowitz, H.R. (1985): New Directions for Product Testing and Sensory Analysis of Foods. Food and Nutrition Press, Connecticut.
12. O'Mahony, M. (1986): Sensory Evaluation Practices. Academic Press, London.
13. Thomson, D.M.H. (1988): Food Acceptability. Elsevier Applied Science, London.
14. Watts, B.M., Ylimaki, G.L., Jeffery, L.E. and Elias, L.G. (1989): Basic Sensory Methods for Food Evaluation. The International Development Research Centre, Ottawa, Canada.
15. Askar, A. and Treptow (1993): Quality Assurance in Tropical Fruit Processing. Springer-Verlag, New York.
16. ASTM (1968 to 1981): Special Technical Publications, American Society for Testing and Materials, Philadelphia.
17. Ball, A.D. and Buckwell, G.D. (1986): Work Out Statistics: 'A' level. MacMillan, London.
18. BSI (1975 to 1989) BS 5098 & BS 5929: Publications of British Standards Institution, London.
19. Resurrecion, A.V.A. (1998). Consumer Sensory Testing for Product Development. Aspen Publishers Inc., Guthersburg, Maryland USA.
20. BIS 6273 (1972) Guide for Sensory Evaluation of foods. Optimum Requirement. Part I. Bureau, Of Indian Standards, Manate Bhavan, New Delhi.
21. Fuller, G.W. (1994) New Food Product Development : From Concept to Market place CRC Press, New York.
22. Man, C.M.D. and Jones A.A. (1994) Shelf life Evaluation of Foods. Blackie Academic and Professional, London.
23. Shapton, D.A. and Shapton, N.F. (1991) Principles and Practices for the Safe Processing of Foods. Butterworth Heinemann Ltd , Oxford.
24. Graf, E. and Saguy, I. S. (1991). Food Product Development : From concept to the Market place, Van Nostrand Reinhold New York.
25. Oickle, J.G. (1990) New Product Development and Value Added. Food Development Division Agriculture, Canada.
26. Proc. Food Processors Institute : A key to Sharpening your Competitive Edge. Food Processors Institute, Washington, DC.

**Journals:**

1. International Journal of Food Science and Technology
2. Food Technology
3. Journal of Food Technology
4. Trends in Food Science and Technology

**Subject Code:** FPT 27

**Subject:** Waste Management and Warehouse Technology in Food Industry (4 Credit)

**Total Lectures=60**

<b>Sr. No.</b>	<b>Topics</b>	<b>Lectures (60 L)</b>
1.	<b>Introduction To Storage And Warehouse</b> Introduction- evaluation of storage, economics, Storage operations- storage terminology. Warehouse design and construction. Material used for warehouse construction	8
2.	<b>Types Of Storage And Respective Warehouse Designs</b> classification of storage, Cold storage and Refrigerated storage, storage of dry and processed foods, storage of fresh foods, storage temperature, storage humidity and other environmental factors affecting storage.	8
3.	<b>Supply Chain Management</b> Principles of supply chain management, Documentation and management of warehouse contents. Logistics of supply chain management. Third Party Logistics: Operations of Indian 3PLs, Distribution Management- Perspectives of buyers, suppliers and producers. Strategies of supply chain management. Role of demand supply prediction in supply chain management. Application of IT in SCM, advance planning and scheduling	16
4.	<b>PEST CONTROL IN WAREHOUSES</b> Pests infesting different types of food materials, Control measures for various pests. Permitted levels of pesticides.	6
5.	<b>WAREHOUSE SAFETY AND DAMAGE CONTROL</b> Reasons for loss and damage of food. Possibility and extent of damage arising from natural events. Strategies for fire and flood control. Insurance cover for the stock and building. Theft protection and security.	8
6.	<b>Waste Management in food Industry</b> Introduction to waste management, Physical and Chemical Characteristics of waste, water quality	5
7.	Liquid waste treatment methods	6
8.	Treatment methods of solid wastes	5
9.	Ion exchange treatment of waste water, Drinking-Water treatment, Recovery of useful materials from effluents by	4

	different methods. Recovery of biological from dairy, meat, fish and poultry processing industry	
10.	Value added products from of agri food processing industry	2

**Subject Code: FPT 28**

**Subject : Practicals Of Bakery And Confectionary Products Technology (6 Credit)**

**Total Practical =30**

<b>Sr. No</b>	<b>TOPICS</b>	<b>Practical (30P)</b>
1.	Introduction of small and bakery equipment's and units of measurements.	2
2.	Study of different types of ovens used in bakery and confectionery	1
3.	Quality Analysis of Raw materials used in bakery and confectionery industry.	1
4.	Bakery: Basic Bread by different methods Bread rolls, Bread sticks, White bread, Brown bread, Soft rolls, Buns Milk bread, Whole wheat bread, Pizza base	3
5.	Determination of Dough rising capacity	1
6.	Determination of effect of ingredients - yeast, fat and sugar	1
7.	Preparation of salt and sweet biscuits and sweet and salty biscuits	3
8.	Preparation of Nan khatai and Melting Momonets cookies	2
9.	Preparation of chocochips cookies (With egg and eggless)	2
10.	Confectionery: Cakes by different methods: Vanilla Sponge cake, Fruit cake, Swiss roll, Chocolate sponge, eggless cake, multigrain cake, red velvet cake	4
11.	Icing : Fondant, Marzipan, Frosting, Dairy and non-dairy cream icing Preparation of toffee, Preparation of chocolate	2
12.	Equipment, maintenance and costing:	4
13.	Setting of bakery unit and its layout. Importance of costing and control, methods of costing and costing methodology in bakeries and confectioneries.	2
14.	Study of hygiene and sanitation in bakery industry and standard specifications of bakery ingredients	2

**Subject Code: FPT 29**

**Subject: Practicals Of New Product Development (6 credit course)**

**Total Practical =30**

<b>Sr. no.</b>	<b>Content</b>	<b>Lectures (30P)</b>
1	To Generate new product ideas, Product concepts, Product design.	3p
2	To study ingredients technology – carbohydrates, proteins, fat, stabilizers, flavors, colorants.	3p
3	To study Prototype development	4p
4	Sensory evaluation of products	2p
5	The Process development	6p
6	Consumer testing, test market strategy	3p
7	Shelf-life study, integration of R&D specification, manufacturing,	3p
8	Product roll-out, presentation of products development.	6p

**Subject Code: FPT 30**

**Subject: Industry Training (6 Credit Course)**

## Semester VI

**Subject Code: FPT 31**

**Subject: Meat, Fish and Poultry Processing (4 Credit Course)**

**Total Lecture: 60**

Sr. No	TOPICS	Lectures (60L)
1	<b>Unit 1: Introduction of Meat</b> Importance of meat processing for entrepreneurship development and Meat plant sanitation and safety. Pre-slaughter transport and care and antimortem inspection Structure of Meat Muscle, Chemical Composition of Meat muscle. Types of meat, Slaughtering of Meat: scientific methods of slaughter-stunning techniques, Mechanical, electrical, chemical methods: Religious methods of slaughter- Jewish, Halal, jhatka methods	8
	<b>Methods of Meat Processing</b> Curing, Tumbling, Massaging, Smoking	4
2	<b>Unit 2: Quality of Meat</b> (Visual Identification, Juiciness ,Firmness Tenderness and Flavour) Water holding capacity, Marbling, Thaw Rigor and storage conditions, Palatability Characters of meat and factors affecting meat quality, tumbling and massaging Chemical composition and physico-chemical properties of meat muscle Postmortem changes in Meat- Rigor Mortis, Biochemical changes associated with Rigor Mortis	8
	<b>Preservation Methods of Meat :</b> Canning, Pickling, Curing, Dehydration, Freezing Preservation of meat by Salting, Chilling, Smoking, Irradiation	5
3	<b>Unit 3: Introduction, Principle and methods of fish Processing</b> (Salting, Curing, Pickling, Cooking, Canning, Drying and Dehydration)	8
4	<b>Unit 4: Quality of fish suitable for processing</b> Appearance, odour, flavor ,texture, ingredients and composition packaging defects and blemishes , size and weight	6
5	<b>Unit 5:</b> <b>Poultry Processing :</b>	6

	Slaughtering of animals and poultry, post-mortem inspection and grading of meat  <b>Methods Of Poultry Processing:</b> Tumbling and Massaging, Smoking , Deboning and Grinding	
	<b>Quality Of Poultry</b> Meat Quality parameters, Meat Colour- pigments, Meat Tenderness, Discolouration and Toughness	5
<b>6</b>	<b>Unit 6: Importance of egg production</b> Egg structure: Composition, Quality characteristics: Shell Colour, Egg White Colour and Yolk Colour processing, storage and Preservation methods of egg : Pickling and canning of eggs	5
<b>7</b>	<b>Unit 7: Laws and regulation in Meat / fish Industry</b> By-products of meat, poultry, fish and eggs and their utilization; Safety standards in meat/ fish industry: HACCP/ISO/MFPO/FSSAI/ Kosher/Halal, EU hygienic regulations and ISO 9000 standards.	5

#### **REFERENCE BOOKS:**

- 1.Production and processing of healthy meat, poultry and fish products by A.M Pearson, T.R
- 2.Dutson and Thayne R.Dutson
- 3.Principles of Meat Science by F. J. Forrest
- 4.Meat Hand Book by Albert Levie
5. Developments in Meat Science Vol. I and II by Ralston Lawrie
- 6.Poultry Production by R. A. Singh
- 7.Meat Technology by Gerard F.



**Subject Code: FPT 32**

**Subject: Entrepreneurship Development and Business Management**

**Total Lecture: 60**

<b>S. No.</b>	<b>Entrepreneurship Development</b>	<b>Lecture (60L )</b>
1	<b>Introduction to Entrepreneurship</b> - definition- Entrepreneur and Entrepreneurship- Nature and characteristics of Entrepreneurship- Need of Entrepreneurship – Competencies of Entrepreneur Creativity and Innovation and significance – Process of Creativity sources of Innovation- Do's and Don't of Innovation	4 3
2.	<b>MSME and Business Organizations</b> – Micro, Small and Medium Enterprises- Concept Role Importance of MSME- Government Policy Initiatives For MSME Schemes for MSME Business organization and Business Laws- Types of Business Organisations- Introduction to Business Laws	9
3	<b>Business Opportunity Search</b> - Concept of Opportunity- How to Generate Business Idea- How to identify Business Opportunity Business Plan- concept- Contents of Business Plan- Why does Business Plan fail? Institutions Supporting Business Enterprises- Central Level and state Level Institutions	7
4	<b>Business Crises and Sickness</b> - Concept- Seven Business Crises- How to avoid Crises- Concept of Sickness- Reasons of Business Sickness Study of Biographies of Entrepreneur- Narayan Murthy – Cyrus Poonawala Business Ethics- Concept- Need of Business Ethics- Scope of Business Ethics Stress Management- concept of stress- Nature and Types of Stress- Symptoms and effect of stress- Sources of stress- stress Management – Personal and Organizational Approach	12
5	<b>Historical Development</b> - Definition of Management- science or Art- Management and Administration Development of Management Thought- contribution of Taylor and Fayol- Management Skills	3

6.	<b>Functions of Management (I)-</b> Planning- Concept- Nature and Purpose- Steps involved in Planning- Objectives- Setting objectives- strategies- Policies- Planning Premises- Forecasting Decision Making – concept-Importance Organization- Organisation Chart- Structure and Process- departmentation by different strategies Line and staff Authority- Benefits and Limitations- decentralization and Delegation of Authority	10
7	<b>Functions of Management (II)-</b> Staffing- Concept- Nature and Importance of Staffing Selection Process Directing and Motivating- Concept of Directing- Characteristics of Direction- Importance of Directing function- Concept of Motivation- Motivation Incentives- Importance of Motivation Co- ordination- concept of Co- ordination- need for Co- ordination-Role of Co- Ordination in Organization Performance- Essentials of effective Co- Ordination- Principles of Co- ordination Leadership- Concept- Features and importance of Leadership- Qualities of a Leader- Functions of Leadership	8
8	<b>Functions of Management (III)</b> Communication- Concept of Communication- Communication Process- Characteristics of Communications- Importance of Communication- Principles of Effective Communication Controlling- Concept of Controlling- Features of Controlling- Functions of controlling- Process of controlling	6

References: For Entrepreneurship Development

1. Vasant Desai- Entrepreneurial Development- Himalaya Publishing House.
2. S. S. Khana- Entrepreneurial Development- S. Chand
3. C. B. Gupta, Srinivasan- Entrepreneurial Development- Sultan Chand and Sons
4. Satish Taneja, S. L. Gupta- Entrepreneur Development – New Venture Creation – Galagotia Publishing Co.
5. Peter Druker- Innovation and Entrepreneurship Heinemann
6. Ramadhar Giri- Business Ethics and Corporate Governance- Adhyanan Publishers and distributors

References: Business Management

1. J. S. Chandan- Management Theory and Practices- Vikas Publishing House Pvt. Ltd.
2. Dr. Pankaj Madan, Dr. Asutosh Priya- Principles and Practices of Modern Management

**Subject Code: FPT 33**

**Subject: Food Laws And Regulations (4 credit)**

**Total Lectures=60**

<b>S. No.</b>	<b>FOOD LAWS AND REGULATIONS</b>	<b>Lecture (60L )</b>
1.	Various types of laws- Mandatory/Regulatory and Voluntary/Optional – Introduction to various food laws (Mandatory) - Food Safety and Standards Act, 2006 (FSSA), Essential Commodity Act, 1955, Prevention of Food Adulteration Act & Rules (PFA Act), 1954 Use of hazard analysis and critical control points in processing of foods. Quality assurance, Total Quality Management; GMP/GHP; GLP, GAP; Sanitary and hygienic practices;	12
2.	Introduction to various food laws (Voluntary) – Agmark Standards (AGMARK), Codex Alimentarius Standards, BIS Standards and Specifications, Consumer Protection Act, 1986	5
3.	Food Safety and Standards Act, 2006 (FSSA) - Need, Scope and Definitions (Chapter I of FSSA, 2006)  2. Establishment of Food Safety and Standards Authority of India (FSSAI) (II), Composition of FSSAI and qualifications for appointment of its Chairperson & other Members 3. Functions of the chairperson and other members of FSSAI 4. Establishment and Functions of Central Advisory Committee, Scientific Panels, Scientific Committees. Duties and functions of Food Authority Labeling issues; International food standards.	14
4.	General principles to be followed in the administration of FSSA (III). General provisions as to articles of food in the FSSA (IV). Special responsibility as to safety (VI). Analysis of food (VIII). Offences and penalties (IX) Enforcement of FSSA (VII). Food Safety Officer (FSO)/ Food Inspector (Called so by PFA Act) - Powers, Duties and functions of FSO	12

5.	<p>Prevention of Food Adulteration Act &amp; Rules (PFA Act), 1954.  Definition. Object of the act. Central committee for food standards</p> <p>2. Consumer Protection Act, 1986 and Consumer Protection Rules, 1987.  Standards of Weights and Measures Act, 1976. - Need, Scope, Functions &amp; Enforcement</p> <p>AGMARK  Bureau of Indian Standards (BIS)  Quality manuals, documentation and audits; Indian &amp; International quality systems and standards like ISO.  Food Codex; Export import policy, export documentation; Laboratory quality procedures and assessment of laboratory performance;  Applications in different food industries.</p>	12
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**Reference Books:**

1. Patricia and Curtis A, An operational Text Book, Guide to Food Laws and Regulations.
2. Srilakshmi B, Food Science.
3. Avanthi Sharma, A text book of Food Science and Technology.
4. Sumati R Mudambi, Shalini M Rao and Rajagopal M.V, Food Science.
5. Potter NN and Hotchkiss JH, Food science
6. Dev Raj, Rakesh Sharma and Joshi V.K, Quality for Value Addition in Food Processing.
7. The Food Safety and Standards act, 2006 along with Rules & Regulations 2011, Commercial Law Publishers (India) Pvt. Ltd.
8. Ranganna, S. (1986): Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi.

**Subject Code: FPT 34**

**Subject: Practical on Meat, Fish and Poultry Processing (6 Credits)**

**Total Practical: 30 x 3hrs**

<b>Sr. No</b>	<b>TOPICS</b>	<b>Practicals (30P )</b>
1.	Preliminary Meat Processing Operations	2
2	Slaughtering and dressing of poultry bird and goat	2
3	Carryout survey of the different processed products from meat, fish and poultry and industries	1
4	Evaluation of Carcass	1
5	Preparation of meat products: canning, pickling, smoking, curing	4
6	Preparation of meat emulsion	1
7	Produce Dehydrated Meat/ Chicken	1
8	Quality Evaluation Test of fish for processing	1
9	Produce Dehydrated canned, pickled fish, Fishmeal protein, and fishmeal powder	2
10	Preparation of fish protein concentrate (FPC)	1
11	Preparation of egg pickle	1
12	Candling of Egg, Grading of egg	2
12	Preservation of shell egg	1
13	Determination of egg quality by Haugh unit	1
14	Evaluation of quality and grading of raw and boiled eggs	2
15	Quality of fish for processing, study of processed fish products	2
16	Preservation of meat/fish by freezing methods	2
17	Prepare processed product from chicken/meat	2
18	Visit to slaughter house / Poultry industries and write a report on it.	1

**Subject Code: FPT 34**

**Subject : Practical on Entrepreneurship Development (6 credits)**

**Total Practical =30**

<b>Sr. No.</b>	<b>Topic</b>	<b>Practical (30P)</b>
1.	Need and importance of entrepreneurship development	<b>2</b>
2.	Quality characteristics of entrepreneur	<b>2</b>
3.	Role of entrepreneur	<b>1</b>
4.	Role of entrepreneurship development for developing country	<b>1</b>
5.	EDP (Entrepreneurship Development programme )	<b>1</b>
6.	Process of entrepreneurship development	<b>1</b>
7.	Motivational factors of entrepreneurship development	<b>1</b>
8.	Types of entrepreneurs	<b>2</b>
9.	Identify the potential of entrepreneur	<b>1</b>
10.	Reasons why entrepreneurs are fail	<b>2</b>
11.	Bank visit- Schemes of government	<b>2</b>
12.	Project formulation	<b>3</b>
13.	Preparation of advertisement	<b>2</b>
14.	Types of market survey and how to conduct market survey	<b>2</b>
15.	Industry visit and report writing	<b>1</b>
16.	Success story of entrepreneur	<b>2</b>
17.	Failure story of entrepreneur	<b>2</b>
18.	SOWC analysis	<b>2</b>

**Subject Code: FPT 35**

**Subject : Project**