PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)

OUTLINES OF TESTS SYLLABI AND COURSES

FOR

Bachelor of Vocation (Food Processing and Preservation)

Session 2018-19

(1st to 6th Semester)
## SCHEME OF B.Voc. (Food Processing and Preservation)
### (SEMESTER SYSTEM)

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title</th>
<th>Generic/Skill Component</th>
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<tr>
<td>*GEN -101</td>
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<td>*GEN -102</td>
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<td>FPP-103</td>
<td>Bakery and Confectionary</td>
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<td>FPP-104</td>
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<td>GC- 202</td>
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<td>Food Packaging Technology</td>
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<td>Industrial Safety, Hazards &amp; Prevention</td>
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<td>Food Plant Layout</td>
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<td>**SIT-201</td>
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*Refer to Generic Components Common to all B.Voc. Courses

** Summer Industrial Training of 4-6 weeks in a relevant Industry after 2nd Semester Examinations during summer break. Training report by the student to be submitted within one week of start of 3rd Semester. Viva-Voce examination to be held within 3-weeks of the start of 3rd Semester.
SCHEME OF B.Voc. (Food Processing and Preservation)
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<tr>
<td>FPP-303</td>
<td>Introduction to food microbiology</td>
<td>Skill</td>
<td>Theory and Practical</td>
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<td>FPP-304</td>
<td>Food analysis: Tools and Techniques</td>
<td>Skill</td>
<td>Theory and Practical</td>
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<td>FPP-305</td>
<td>Documentation and record keeping in food industry</td>
<td>Skill</td>
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**SEMESTER IV**

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<td>Essentials of food hygiene</td>
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*Refer to Generic Components Common to all B.Voc. Courses

** Summer Industrial Training of 4-6 weeks in a relevant Industry after 4th Semester Examinations during summer break. Training report by the student to be submitted within one week of start of 5th Semester. Viva-Voce examination to be held within 3-weeks of the start of 5th semester.
SCHEME OF B.Voc. (Food Processing and Preservation)  
(SEMESTER SYSTEM)

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<td>Critical Thinking and Elementary Statistics</td>
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<td>GC-502</td>
<td>Introduction To Research Methodology And Report Writing</td>
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<td>FPP-503</td>
<td>Principles of Management</td>
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<td>Production planning in food industry</td>
<td>Skill</td>
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<td>FPP-505</td>
<td>Production optimization and cost efficiency</td>
<td>Skill</td>
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<td>**WIT-601</td>
<td>Winter Industrial/ In-house Training</td>
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Note: Winter Industrial/ In-house Training of 2-3 weeks in a relevant area after 5th Semester Examinations in winter break.

<table>
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*Refer to Generic Components Common to all B.Voc. Courses  
**Winter Industrial/ In-house Training of 2-3 weeks done after 5th Semester Examinations and before start of 6th Semester. Training report by the student to be submitted within one week of start of 6th Semester. Viva-Voce examination to be held within 3-weeks of the start of 6th Semester.
B.Voc. (Food Processing and Preservation)
Semester I

Paper Title: BAKERY AND CONFECTIONERY
Paper Code: FPP 103

Course Objectives:

- To understand the composition of different ingredients used in Baking and confectionary industry.
- To know the methods of processing and preservation of foods.
- To identify the microorganisms of food commodities of plant and animal origin.
- To learn about Food borne diseases and microorganisms.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I


Unit II


Unit III

Unit IV

**Bread Diseases:** Rope and Mould, Factors responsible for it and preventive measures.

**Faults and Remedies:** Basic reasons and suggested remedies: Bread, Cake and Biscuits.

**Text books/ References:**

3. Bakery-I: Student handbook and practical manual- CBSE.

**Practical based on FPP103**

Practical: 40  
Internal Assessment: 10  
Total Marks: 50  
Time: 3 hours

1. Preparation of White Bread.  
2. Principle and preparation of Fruit cake.  
3. Studying the effect of temperature on process of biscuit making.  
4. To make garlic bread and sensory analysis.  
5. To do icing on the cake.  
6. Isolation of microbes from spoiled bread.  
7. To study effect of pasteurization on milk  
8. Methylene blue reduction test in milk
B.Voc. (Food Processing and Preservation)
Semester I

Paper Title: DAIRY SCIENCE & TECHNOLOGY
Paper Code: FPP 104

Theory: 40
Internal Assessment: 10
Total Marks:50
Time: 3 hours

Course Objectives:

• To create interest among students about different aspects of dairy industry.
• To study quality standards and production of various types of milk and milk products.
• To study the role of dairy farming in Indian economy

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I


Unit II

Dairy Animals: Care and management of different dairy animals. New borns, milch, pregnant animals, bull and sick animals. Feed formulation: Nutrient requirement of different dairy animals. Common diseases: bacterial, viral, fungal, prevention and their control (Vaccination, deworming). Development of transgenic dairy animals.

Unit III

Composition, standards, manufacturing: Process, equipment and defects during manufacturing and storage of dairy products and by products (Cream, paneer, yogurt, milk powder- skimmed milk and whitener, casein, whey concentrate, lactose, ghee residue ).
Unit IV

**Dairy development in India:** Present status, future prospective and its role in Indian economy. Important government initiative (Operation Flood). Role of dairy development organizations (NDRI, IVRI, Amul) in dairy development.

**Text books/ References:**


**Practical based on FPP 104**

**Practical:** 40
**Internal Assessment:** 10
**Total Marks:** 50
**Time:** 3 hours

1. Gerber fat test for milk.
2. Sampling of milk and milk products for microbiological analysis
3. Platform test for milk analysis.
4. Proximate analysis of feed: Dry matter, nitrogen, crude fiber and total ash.
5. Visit and study a nearby milk union/ dairy and prepare a checklist of problems in procurement and milk distribution.
6. Listing of quality control agencies at national and international levels.
7. Preparation of flavored milk: TM and DTM
Course Objectives:

- To understand the different principles of food quality control.
- To assess the food quality assurance of bakery products.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I

**Food Quality control:** Objectives, importance and functions of quality control. Principles of food quality control and quality assurance. Quality control and assessment in food materials used in baking industry and finished bakery products.

Unit II

**Total Quality Management (TQM):** Good manufacturing practices, good hygienic practices, good lab practices, general awareness and role of management practices in quality control.

**Microbial quality control:** Determination of microorganisms in foods by cultural, microscopic, physical, chemical, immunological and bioassay methods

Unit III

**Food regulations, grade and standards:** Concepts of Codex Alimentarius, HACCP, USFDA, ISO 9000 series etc. Food laws and standards, Food standards and safety Act: salient provisions and prospects, role of various national and international agencies.

Unit IV

**Food adulteration:** Nature of adulteration, methods of evaluation of food adulterants and toxic constituents of bakery products

Sensory quality evaluation: Introduction, methods, panel screening, selection methods, Sensory and instrumental analysis in quality control.
Text books/ References:


Practical based on FPP 105

Practical: 40  
Internal Assessment: 10  
Total Marks: 50  
Time: 3 hours

1. Techniques of quality assessment of different natural and processed foods.
2. Identification and ranking of food product attributes.
5. Study of cleaning and sanitizers used in pre and post-operative processes in bakery industry.
6. Documentation of details of baking ingredients, process and finished products used in baking industry.
B. Voc. (Food Processing and Preservation)  
Semester II

Paper Title: FOOD PACKAGING TECHNOLOGY  
Paper Code: FPP 203

Course Objective:

- To enable the students to understand about packaging and packaging materials, interaction of food items with packaging materials

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I

Introduction to Food Packaging: Functions of packaging, Effect of environmental factors on quality of food.

Estimation of shelf life, analysis of storage requirement, accelerated storage studies: Vacuum and Inert Gas Packaging: Tests on packaging materials, Mechanical strength (Tension, notch and tearing strengths), Gas and water vapor transmission rates.

Unit II

Metal Cans as Packaging material: Types of Metallic Cans: Tin cans and Aluminum cans. Specialty of Open top sanitary cans, Lacquers and their use, Three piece cans and two piece cans, Aerosol Cans.

Introduction to Canning operations: Can Reformer, Flanger, Seaming, Can closures, Glass jars and Bottles in food packaging, Design features and applications, Sterilization of jars and bottles.

Unit III

Flexible Films Packaging: Formation of Films and pouches, Plastics used and their Specific applications. Rigid and Semi rigid plastic packaging methods.

Unit IV

Filling And Sealing Operations For Various Types of Packages: Closing and sealing of rigid plastic containers. Filling and sealing of flexible plastic containers, Seal types, hot wire sealing, hot bar sealing and impulse sealing.

Active packaging, Moisture control, CO\textsubscript{2} and Oxygen scavenging, Modified atmosphere packaging: principles and applications. Permeability of gases in packs.

Text books/ References:


Practical based on FPP 203

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. To study quality and strength of packaging materials.
2. Measurement of cartons’ dimensions as per organizational standards.
4. Determination of tensile strength of given material.
5. Testing of chemical resistance of packaging materials.
6. Demonstration of sealing processes used in food industry.
7. Demonstration of filling process.
B.Voc. (Food Processing and Preservation)
Semester II

Paper Title: INDUSTRIAL SAFETY, HAZARDS & PREVENTION
Paper Code: FPP 204

Theory: 40
Internal Assessment: 10
Total Marks:50
Time: 3 hours

Course Objectives:

• To create awareness about health hazards of industrial substances.
• To evaluate the threshold value of industrial hygiene and safety.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

UNIT-I


UNIT-II

Microbial Contaminants associated with food: Bacteria, viruses, fungus, molds and yeast. Factors affecting the growth of microbes in food. General Microbiological Methods of enumeration and isolation of food related microbes.

UNIT-III

Food Toxicology: Toxic materials and their properties, effect of dose and exposure time, relationship and predictive models for response, Threshold value and its definitions, material safety data sheets, industrial hygiene evaluation.

UNIT-IV

Text books/ References:


Practical based on FPP 204

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. Methods of sterilization and preparation of media.
4. Gram staining, negative and lactophenol staining.
5. Enumeration and isolation of bacteria and fungi from water/milk and contaminated food.
6. Demonstration of different safety aspects and maintenance of material safety data sheets followed in food industry.
Course objective:

- Exposure of the students to the basic setup of a Food industry
- To make them conversant with the machinery and equipment in a food industry

Instructions for paper setters:

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3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I

**Industrial plant layout and design:** Basic concept with special reference to food packaging industries. Application of HACCP concept, ISO, FPO & MPO requirements in food plant layout and design.

Unit II

**Plant Design:** Design consideration for location of food plants. Basic understanding of equipment layout and ventilation in food processing plants. Preparation of flow sheets for material movement and utility consumption in food plants.

Unit III

**Plant layout and design:** Bakery, Biscuit, Fruit and Vegetable processing, Beverages industry.

Unit IV

**Plant layout and design:** Milk and milk products processing. Miscellaneous aspects of plant layout and design: provision for waste disposal, safety arrangements etc.

Text books/ References:


**Practical based on FPP 205**

Practical: 40
Internal Assessment: 10
Total Marks: 50

1. Industrial visit and report making.
B.Voc. (Food Processing and Preservation)
Semester III

Paper Title: INTRODUCTION TO FOOD MICROBIOLOGY
Paper Code: FPP 303

Course Objectives:

• To understand the different types of microbes in food, concept of cleanliness, sterilization, maintenance of lab equipment, microbial growth, food spoilage and beneficial role of microbes in food.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit-I

History and Development of Food Microbiology, Characteristics of Predominant microbes in food: Bacteria, yeasts, Moulds. Normal microbiological quality of foods and its significance.
Sources of microbes in food: Soil, air, water, plants, animals, food ingredients, equipment. Structure of prokaryotic cells, cell wall of Gram Positive and Gram negative bacteria
Concept of culture medium: Types based on: consistency, constituents/ ingredients, oxygen requirement.

Unit-II

Control of microorganisms: Concept of sterilization and pasteurization, physical and chemical agents, mechanical removal methods.
Microbial growth: phases of growth, generation time, specific growth rate, optimum growth. Chemostat and turbidostat.
Measurement of Microbial growth: Breed Method, colony forming unit, coulter counter, Turbidimetry method.
Factors responsible for growth of microbes in food: temperature, water activity, pH, oxygen, pressure, radiation. Sporulation and germination. Importance of spores in foods. Importance of stress adapted microbes in food.
Unit III

Types of Fermentation process: Batch, continuous and fed batch and their significance. Surface and submerged fermentation. Basic concept of fermenters: parts and their function.


Unit IV

Microbial Food Spoilage: Factors responsible for spoilage, spoilage of specific food types, spoilage bacteria in raw and pasteurized foods, canned foods, soft drinks and fruit juices, refrigerated foods. Indicators of microbial food spoilage.

Textbooks/References:


Practical based on FPP -303

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. Study of basic equipment: laminar flow, homogenizer, autoclave, biosafety systems
2. Sterilization of glassware and other lab equipment
3. Preparation and sterilization of liquid and solid media for isolation of microbes
4. Isolation of bacteria and fungus from spoiled food.
5. Identification of isolated bacteria by simple, gram staining and negative staining

Textbooks/ References:

B.Voc. (Food Processing and Preservation)
Semester III

Paper Title: FOOD ANALYSIS: TOOLS AND TECHNIQUES
Paper Code: FPP 304

Theory: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

Course Objectives:

- To enable the students to understand the properties of food and detection of microorganisms using various basic and advance tools and techniques.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks

Unit-I

Physical and sensory properties: An introduction to rheological and thermal properties of foods and their measurements. Concept of moisture and water holding capacity of different food items and their significance. Analytical methods for estimation of moisture and ash content in foods. Color measurement in different food types and its nutritional importance.

Detection of microorganisms in food: Sampling plan & procedure for microbial analysis. Qualitative methods to isolate pathogenic microorganisms and test for bacterial toxins in foods. Quantitative methods for microbial enumeration: Direct and indirect methods

Unit-II

Techniques in food analysis-I: Paper and Thin Layer Chromatography: principle and applications. Gel filtration and Ion exchange chromatography: principle and applications.

Microscopy: Theory and application of Bright Field, Dark Field, Fluorescent microscopy Basic concepts of SEM and TEM

Unit-III

Techniques in food analysis-II: Centrifugation, filtration, Electrophoresis, radiations: Principle and their role in detection of food constituents and contaminants in raw and packaged foods.
Unit-IV

Advanced lab equipment and their application in food analysis: Gas chromatography, HPLC, MS, GC-MS, LC-MS, Atomic absorption spectroscopy, ELISA, PCR and RT-PCR (Principle and applications only)

Textbooks/References:


Practical based on FPP-304

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. To find moisture content of given food sample by lab oven method
2. To find out ash content in the given food sample
3. To estimate amount of protein content by Kjeldahl method and Lowry method
4. To perform estimation of total carbohydrates in given food sample
5. To find out the amount of crude fibre in given food sample
6. To test different food samples for adulteration: milk, ghee, butter, honey
7. Demonstration of AAS and gas liquid chromatography instrumentation and their use in food analysis
B.Voc. (Food Processing and Preservation)  
Semester III

Paper Title: DOCUMENTATION AND RECORD KEEPING IN FOOD INDUSTRY  
Paper Code: FPP 305

Course Objectives:

- To enable the students to understand the importance of documentation in food industry and study preparation of records.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

UNIT I

Documents and records: Concept of Documents and records, General principles for document and record development and maintenance. Importance of documents and record keeping in food industry. Types of records maintained by food industry. Documentation system formats- essays, matrix, essay/matrix combination.

Food safety records: Record maintenance by transporters and non-transporters of food. Importance of documentation and records in risk assessment and management in food industry.

UNIT II


UNIT III

Record keeping and hazard control: HACCP system, Types of HACCP records, Control of documents, Retention of records, Review of records, disposal and retrieval of HACCP records.
UNIT IV

Data Protection: Confidentiality maintenance of records, Concerns related to data theft in food industry, Role of FDA and FSMA in protection of available food data, Role of ICT in data protection. General laws for record maintenance and protection.

Textbooks/References:


Practical based on FPP-305

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. Maintain periodic record book of the laboratory work.
2. Risk assessment in your laboratory and report maintenance
3. Study of equipment manuals.
Course Objective:

- To create awareness about food poisoning, role of personal hygiene, pest control, cleaning and disinfection and risk of food contamination during packaging, transport, labeling and waste disposal

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit I

Food hygiene: Food poisoning, contamination, sources of food poisoning.

Hygiene control in industries: Direct and indirect factory environment, building structure and maintenance, manufacturing operation, food packaging.

Unit II

Personal Hygiene: Personal responsibilities, cleaning of hands, face, head and wounds.

Pest control: Types of pests, their control systems and prevention of access.

Unit III

Temperature control: Temperature and bacteria, chilled and frozen foods, refrigeration and freezing, storage of food.

Cleaning and Disinfection: Cleaning of workplace, wet/dry cleaning, cleaning out of place, cleaning in place, cleaning and disinfectants, cleaning implements and portable equipment.

Unit IV
Packaging, Labeling and Transportation: General hygiene rules during labeling, packaging and transportation

Waste disposal: Methods for waste disposals, cleaning schedules.

Textbooks/References:


Practical based on FPP 403

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

The students will prepare charts and labels for labs regarding essential practices for food safety.
B. Voc. (Food Processing and Preservation)
Semester IV

Paper Title: FOOD PATHOGENS
Paper Code: FPP 404

Course Objectives:

• To create awareness about the food pathogens, sources of food and water borne diseases, their causative agents, characteristics, pathogenesis, Isolation of food borne pathogens and their detection.

Instructions for paper setters:
1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

Unit 1


Unit II

Bacterial agents of food borne illness: Characteristics, pathogenesis, clinical symptoms, isolation and detection methods of Bacillus sp., Clostridium botulinum, Clostridium perfringens, Escherichia coli, Listeria monocytogenes, Salmonella sp., Shigella sp., Staphylococcus aureus, Vibrio sp.

Unit III

Foodborne Virus: Characteristics, pathogenesis, clinical symptoms, isolation and detection methods Polio, Gastroenteritis virus (Rota virus and Noro virus), Hepatitis A and Hepatitis C.
Protozoan agents for food borne illness: Pathogenesis and prevention of Giardia lamblia and Entamoeba histolytica.
Unit IV

Toxigenic Fungi and mycotoxins: Mycotoxins of *Aspergillus sp.*, *Penicillium sp.*, *Fusarium sp.* and their association with various foods. Control of mycotoxins in food.

Bacterial toxins: Toxins of Enteric bacteria and their associated hazards.

Methods to control foodborne diseases outbreaks: Industrial and foodservice establishment/household specific control measure.

Textbooks/References:


Practical based on FPP 404

Practical: 40  
Internal Assessment: 10  
Total Marks: 50  
Time: 3 hours

1. Analysis of mycotoxins in fungal-contaminated food materials.  
2. Presumptive test for coliforms in butter.  
3. Differential test of staphylococci through growth on agar plates.  
4. Differentiation and identification of Streptococci.  
5. Control of growth of pathogens in food samples.
B.Voc. (Food Processing and Preservation)
Semester IV

Paper Title: FOOD SAFETY, STANDARDS AND REGULATIONS
Paper Code: FPP 405

Course Objective:

- To make the students conversant with latest rules and regulation in Food safety as per FSSAI guidelines especially dealing with work place.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

UNIT I

Food safety: Importance of food safety, concerns related to food process hygiene and food products. Classification of microbiological quality, hygiene indicator organisms for various foods.

Overview of Food Safety and Standards Act, 2006: Salient features of Food Safety & Standards Act, 2006, Major aspects of the act, New provisions, Major deviations from the existing regulations and the implications of Change, New Concepts and their legal implications.

UNIT II

Food safety and Standards (Licensing and Registration of Food businesses) regulation, 2011:

Salient feature of schedule 1, 2, 3

Salient feature of schedule 4: General Hygienic and Sanitary practices to be followed by Food Business operators

Part – I: General Hygienic and Sanitary Practices to be followed by Petty Food Business Operators
Part-II: General Requirements on Hygienic and Sanitary Practices to be followed by all Food Business Operators

PART-III: Specific Hygienic and Sanitary Practices to be followed by Food Business Operators engaged in manufacture, processing, storing and selling of Milk and Milk Products

PART IV: Specific Hygienic and Sanitary Practices to be followed by Food Business Operators engaged in manufacture, processing, storing and selling of Meat and Meat Products

Part – V: Specific Hygienic and Sanitary Practices to be followed by Practices to be followed by Food Business Operators engaged in catering / food service establishments

**Contaminants and food safety**: General metal contaminants and their effects in food products—lead, copper, arsenic, tin, zinc, mercury. Pesticides and insecticides as food contaminants. General regulations specified for different contaminants in food in India.

**UNIT III**

Food Safety and Standards (Food product standards and Food Additives) Regulation, 2011 (part I): Salient features of regulation

Food Safety and Standards (Food product standards and food additives) Regulation, 2011 (part II): Salient features of Regulation

**UNIT IV**

Food Safety and Standards (Prohibition and Restriction on sales) Regulation, 2011: Salient features of regulation

Food Safety and Standards (Packaging and Labeling) Regulation, 2011: Salient features of regulation

Food Safety and Standards (contaminants, toxins and residues) Regulation, 2011: Salient features of regulation

Food Safety and Standards (Laboratory and sampling analysis) Regulation, 2011: Salient features of regulation

**Textbooks/References:**

Practical based on FPP-405

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

The student will study and prepare a report of Food Safety Standards and Regulation as per FSSAI pertaining to workplace especially health hazards, hygiene practices and disposal of waste etc.
B.Voc. (Food Processing and Preservation)
Semester V

Paper Title: PRINCIPLES OF MANAGEMENT
Paper Code: FPP 503

Theory: 80
Internal Assessment: 20
Total Marks: 100
Time: 3 hours

Course Objective:

• To make the students understand the concepts of management & their Practical application in the food industry.

Instructions for paper setters:

1. The syllabus of this paper has been divided into FOUR units.
2. Examiner will set a total of NINE questions comprising two questions from each unit, including one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I

Organization: Concept of organization, Goals and policies, Nature & importance of organization. Standards of business processes of organization.

Principles of organizations: Formal & Informal, Centralized & Decentralized.


UNIT II


Decision-making: Types of decisions. Step by step decision making process.

UNIT III

Types of communication: Upward & downward, Verbal & Nonverbal, Formal & Informal.
Barriers to communication, Methods of improving communication and effectiveness.

Staffing: Definition, Delegation and Departmentalization. Authority & responsibility. SWOT analysis of staff. Recognizing and rewarding staff members.

UNIT IV


Textbooks/References:
B.Voc. (Food Processing and Preservation)
Semester V

Paper Title: PRODUCTION PLANNING IN FOOD INDUSTRY
Paper Code: FPP 504

Course Objective:

• To make students understand the production planning and subsequent production control.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

UNIT I

Production plan of food production and processing industry: Quality policy and objectives of food processing. Sales and customer needs/market requirements.


Standard operating procedures: purchasing raw materials, receiving raw materials, storage, cleaning, holding, personal hygiene, facility and equipment.

Plant Layout: Overview and types of Plant Layout, Process Layout and Product Layout.

UNIT II


UNIT III

**UNIT IV**

**Management of trials production:** Objective of trial production and trial product, processing method and specification. Selection of production team for trial. Preparation of technical production procedures (considering all engineering and process parameters for new product trial).

Preparation of detailed trial production schedule. Monitoring trial production. Documentation and evaluation of trial production data and identification of process/parameters to be modified/changed to achieve required specification.

**Textbooks/References:**

**Practical based on FPP-504**

**Practical:** 40  
**Internal Assessment:** 10  
**Total Marks:** 50  
**Time:** 3 hours

1. Prepare list of raw materials used for production and the finished dairy/ bakery products.
2. Study of the process parameters and provision of necessary information to fill the process chart of any dairy/ bakery product.
3. Prepare process charts for food product and processing of any dairy/ bakery product.
4. Prepare report on equipment manuals, process documents and internal information to understand the equipment’s operation and process requirement.
5. Compile performance data of equipment to identify cause for lack of performance of any food processing industry.
B.Voc. (Food Processing and Preservation)  
Semester V

Paper Title: PRODUCTION OPTIMIZATION & COST EFFICIENCY  
Paper Code: FPP 505

Course Objective:

- To make students understand management of production optimization and cost efficiency by managing utilities and energy, optimizing production and implementing changes in production process.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks.

UNIT I

Overview of production process: Analysis of equipment performance, process capability and change over time, maintenance, consumables, power.

Factors affecting performance of production and improvement opportunities.

UNIT II

Utilities and energy usage: Types of Production utilities in food industry. Estimating utilities and energy usage requirement. Energy conservation guidelines in food industry.

Procedures for promoting optimum utilities usage, Review of changes and implementation feedback. Methods for promoting renewable and efficient resource and utilities management.

UNIT III


Methods for impact evaluation on product quality. Documentation of production process changes.
UNIT IV

**Inventory Management:** Objectives of Inventory Management. Importance of inventory control. Techniques of inventory control: Economic order quantity, ABC analysis and Perpetual inventory system.


**Textbooks/References:**

**Practical based on FPP-505**

**Practical:** 40
**Internal Assessment:** 10
**Total Marks:** 50
**Time:** 3 hours

1. Preparation of report on different methods for optimum usage of energy in food industry in India.
2. Visit any food industry unit and prepare report on methods used for production process optimization.
3. Identify cost saving options and proposed changes in food production process.
4. Prepare flowcharts on purchasing cycle of different (Bakery/ Confectionary/Dairy/Fruit and vegetable) food processing unit.
5. Discuss laws introduced by Indian Government to promote efficient and renewable resources promotion in food industries.
Course Objective:

- To make students understand the importance of budget in food industry and manage production within budget during production process in food processing unit.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit, including compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
4. All questions carry equal marks.

UNIT I


UNIT II


UNIT III

Variance analysis: Types of variances: cost variances, material variances, labor variances, overhead and fixed overhead variances, sales variance, profit variance.

Identification of variances: Identify situations of actual budget exceeds the approved budget. Investigate reason for variance. Corrective measures to keep budget under control.

UNIT IV

Financial and accounting procedures of the organisation: Principles and processes involved in business and financial control.

Textbooks/References:
Course Objective:

- To make students understand various documents in food industry and develop processes to pass audits.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit. and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks

UNIT I

Documentation and record keeping in production plant: Importance of documentation. Training on documentation system. Up-to-date and accessible documents for audits on production process. Documentation of recommendation/corrective actions. Methods to track production information from documented and maintained records.


UNIT II

Standard Operating Procedures: Standard operating procedures: definition, procedure, purpose, format, developing, implementing and effective writing. Quality control policy and quality objectives of food processing company.

Food Safety Systems Manual: Food safety systems policies. Collection of documents with all validated and authorized written policies, procedures and programs.

UNIT III

Auditing: Types, Audit requirement in production for food safety. Audit reports for different department- audit exercise. Audit procedures and audit requirements to ensure food safety, hygiene and sanitation in the organization. Methods of auditing to meet and maintain industry standards and regulatory requirements.
UNIT IV


**Textbooks/References:**

**Practical based on FPP-604**

- **Practical:** 40
- **Internal Assessment:** 10
- **Total Marks:** 50
- **Time:** 3 hours

1. Prepare report on technical documents related to production process of the organization
2. Study legal and safety documents pertaining to food industry.
3. Prepare HACCP based SOP checklist of any food processing unit.
5. Discuss any 5 food safety policies.
B.Voc. (Food Processing and Preservation)
Semester VI

Paper Title: FOOD SAFETY AND ENVIRONMENTAL POLICIES
Paper Code: FPP 605

Course Objective:

- To ensure environmental safety and implement health and safety policies in food industry.

Instructions for paper setters:

1. The syllabus of this paper has been divided into four units.
2. Examiner will set a total of nine questions comprising two questions from each unit and one compulsory question of short answer type covering the whole syllabus.
3. The students are required to attempt five questions in total including compulsory question and one question from each unit.
4. All questions carry equal marks

UNIT I

Hazards in food industry: Types of hazards: physical, chemical and biological hazards. Methods to measure control and prevent hazards. Safe work procedures: In production area and during production process for food industry.

Identification of safety and environmental hazards relevant to production processes. Environmental management system and environmental standards.

UNIT II


Sources of contamination: Food safety testing methods. Basic concept of food safety regulations, guidelines and codes as per FSSAI. Hygiene and sanitation in food processing unit. Legal Basis for risk assessment. Role of material handling in food safety.

UNIT III

UNIT IV


Food regulatory systems: Introduction to FSSAI, GMP, GHP, HACCP, QMS, ISO.

Textbooks/References:

Practical based on FPP-605

Practical: 40
Internal Assessment: 10
Total Marks: 50
Time: 3 hours

1. Write project reports on waste management of food industry (Bakery/ Dairy/ Beverage/ Fruit and vegetable industry).
2. Read legal and safety, environmental and regulatory documents pertaining to the organization and prepare a report.
3. Prepare flowcharts for treatment of various food hazards in food industry.
4. Prepare flowcharts on various environment hazards in food industry.
5. Study of procedures for ensuring the quality and hygiene of the product compliance with FSSAI standards.
6. Prepare report on integrated management system as per HACCP & ISO.