

BACHELOR OF VOCATION (B.Voc.)
(FOOD PROCESSING)

PROGRAMME CODE: FDPB3PUP

SYLLABUS

PART I (Semester I&II)

FOR

Session 2021-22, 2022-23, 2023-24

Under

CHOICE BASED CREDIT SYSTEM



PUNJABI UNIVERSITY, PATIALA

SYLLABUS
BACHELOR OF VOCATION (B.Voc.)
FOOD PROCESSING
 OUTLINE OF PAPERS AND TESTS
FOR
B. Voc. FOOD PROCESSING PART –I (Semester I)
PROGRAMME CODE: FDPB3PUP
Session: 2021-22, 2022-23& 2023-24

Code	Subjects	L	T	P	Total Credits*	External Marks	Internal Marks	Practical Marks	Total Marks
FDPB1101T	Punjabi –I (Qualifying)**	3	1	0	4	75	25		100 (Satisfactory /Unsatisfactory)
FDPB1102T	Introduction to computers	3	1	0	4	74	26		100
FDPB1103T	Documentation in food processing	3	0	0	3	74	26		100
FDPB1104T	Basics of Food processing	3	0	0	3	74	26		100
FDPB1105T	Dairy Processing	3	0	0	3	74	26		100
FDPB1101L	Practical Paper I pertaining to FDPB1102T			3	3			45	45
FDPB1102L	Practical Paper II pertaining to FDPB1103T			3	3			45	45
FDPB1103L	Practical Paper III pertaining to FDPB1104T			3	3			45	45
FDPB1104L	Practical Paper IV pertaining to FDPB1105T			3	3			45	45
	Industrial Visit			1	1				20
	Total General Education Component	12			12				600
QP- FIC/ Q2002 (Specific job Role)	Dairy Processing Equipment Operator Level-4/or any other qualification pack of level 4				18				Evaluation Shall be done by FICSI Result will be communicated to the university by college

Note: *one credit =15 hrs./1 lecture of 1 hr.

** Qualifying paper marks are not included in total marks.

**BACHELOR OF VOCATION (B.Voc.)
(FOOD PROCESSING)
OUTLINE OF PAPERS AND TESTS
FOR
B. Voc. FOOD PROCESSING PART –I (Semester II)
PROGRAMME CODE: FDPB3PUP
Session: 2021-22, 2022-23& 2023-24**

Code	Subjects	L	T	P	Total Credits*	External Marks	Internal Marks	Practical Marks	Total Marks
FDPB1201T	Punjabi-II (Qualifying) **	1	1	0	4	75	25		100**
FDPB1202T	Holistic Development I:Personality Development	2	2	0	4	74	26		100
FDPB1203T	Basics of food packaging	3	0	0	3	74	26		100
FDPB1204T	Introductory Food Microbiology	3	0	0	3	74	26		100
FDPB1205T	Food products Packaging Technology	3	0	0	3	74	26		100
FDPB1206T	Drug Abuse: problem, Management and Prevention**(Qualifying)		1			70	30		100*
FDPB1201L	Practical Paper V pertaining to FDPB1202T			3	3			45	45
FDPB1202L	Practical Paper V pertaining to FDPB1203T			3	3			45	45
FDPB1203L	Practical Paper V pertaining to FDPB1204T			3	3			45	45
FDPB1204L	Practical Paper VII: pertaining to FDPB1205T			3	3			45	45
	Industrial Visit			1	1				20
	Total General Education Component	12							600
QPFIC/Q70 01 (SPECIFIC JOB ROLE)	Food Products Packaging Technician Level-5/or any other qualification pack of level 5				18				Evaluation will be done by FICSI, Result will be communicated to the university by college

Note: *one credit =15 hrs./1 lecture of 1 hr.

** Qualifying paper marks are not included in total marks (**Qualifying paper**)

CODE: FDPB1101T	PUNJABI-I
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Session 2021-22 → Faculty of Languages → Punjabi → Under Graduate → Under Graduate Degree Level Professional Courses Common Syllabus Punjabi or Mudla Gyan or Elementary Punjabi.

CODE: FDPB1102T

INTRODUCTION TO COMPUTERS OBJECTIVES

OBJECTIVES:

- Students will learn about operating system MS window.
- Students will gain the information about MS word, MS excel and MS power point.
- Students will evaluate implementation and applications of computers in different food industries.
- Students will practice documentation using MS word.
- Students will practice creation of tables, forms, sheets and queries using MS ACCESS.
- Students will be able to demonstrate working and applications of internet using many browsers.

Time Allowed: 3hrs;MM: 74;Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. **Operating system MS Window** -Definition & functions, Basic components of windows, types of icons, taskbar, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel -adding and removing software and hardware, setting date and time, screen saver and appearance.
Introduction to concept of Internet: Internet applications, www, Email, ftp, web browsers(Internet explorer, Google Chrome, Mozilla).
2. **MS-Word** –Documentation, Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advanced features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

SECTION-B

3. **MS-Excel** - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation. Database Management using Excel-Sorting, Filtering, Table, Validation, Goal Seek, Scenario.
4. **MS-PowerPoint:** Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds and insertion, Inserting Animated Pictures

REFERENCES

1. Russell A. Stultz, Learn Microsoft Office – BPB Publication
2. Microsoft Office – Complete Reference – BPB Publication
3. P.K. Sinha and P. Sinha, 2002, Foundations of Computing, First Edition, BPB.
4. Torben Lage Frandsen, Microsoft office word.
5. Word 2010 Introduction by Stephen
6. Chetan Srivastva, Fundamentals of Information Technology, Kalyani Publishers.
7. Turban Mclean and Wetbrete, 2011, Information Technology and Management, Second Edition, John Wiley & Sons.
8. Satish Jain, 1999, Information Technology, BPB.
9. V. Rajaraman, Fundamental of Computers – (Prentice Hall) 10. P. K. Sinha, Fundamental of Computers – (B.P.B publication)
11. ALEXIS LEON, Introduction to Information Systems.
12. Dr. S. Chand, Courter, G Marquis (1999). Microsoft Office 2000, Computer Fundamentals & Its Business Applications, Professional Edition. BPB.

PRACTICALS:FDPB1101L

M.M. 45

1. MS-Windows: features
2. Documentation Using MS-Word
3. Electronic Spread Sheet using MS-Excel
4. Database Management using Excel
5. Presentation using MS-PowerPoint
6. Creating tables in MS ACCESS using different ways.
7. Import and export data from MS ACCESS.
8. Creating queries in MS ACCESS
9. Creating forms in MS ACCESS
10. Working of Internet with Different Browsers (Internet Explorer, Google Chrome, Mozilla).
11. A _____

applications of Internet. (Handling Email accounts.

12. Student Have to Do Following Activities:

- a. How to create Email?
- b. How to send email?
- c. How to Download the Data?
- d. How to attach files with email?

CODE: FDPB1103T	DOCUMENTATION IN FOOD PROCESSING
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OBJECTIVES:

- Students will learn about documentation in food industry.
- Students will gain the information about programs needed to inspect raw materials in different food industries.
- Learners will come to know about applications of computer in different food industries.
- Students will learn and practice implementation, life cycle and applications of Enterprise resource planning (ERP).
- Learners will have information about primary, secondary and tertiary packaging.
- Students will perform analysis of data using statistical packages.
- Learners will practice various software used in food industry.
- Students will analyze quality of food products using ERP.

Time Allowed 3hrs;MM: 74;Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Introduction to documentation in food industry, documentation and inspection of raw material in food industry. Methods of documentation for raw material to finished product.
2. Familiarization with the application of computer in some common food industries: milk plant & fruits vegetable plants, starting from the receiving of raw material up to the storage & dispatch of finished product. Statistical analysis in food industry- application of mean, median and standard deviation in

food industry.

SECTION-B

3. Introduction and implementation of ERP, application of ERP in food industry, Essential guidelines of ERP in food processing industries.
4. Documentation of finished product detail- name of the product, batch number, time of packing, date of manufacture, date of expiry, other label detail, primary ,secondary and tertiary packing material for finished product, storage conditions.

REFERENCES

- 1.K.T.Patel and N.P Chotai, Apr-jun,2011,Documentation and record:Harmonized GMP requirement, v(3).
- 2.P.J Lovett,A Ingram, C.N Bancrot, 22 November 2000,Knowledge-based engineering for SMEs- a methodology,Vol.107(1):384-389
- 3.TufanKoc, 7 May 2007, The impact of ISO 9000 quality management system on manufacturing, Vol.186(1):207-213,
4. Inka Heidi Vilpola, 20 feb 2008, page 47-76, A Method for improving ERP implementation success by the principle and process of usercentred design.
- 5.A Rockley, 1987, Proceedings of the 34th International Technicalonline documentation: from proposal to finished product.

PRACTICALS: FDPB1102L

MM.: 45

1. Problem solving using spread sheet and word.
2. Use of statistical package for analysis of data
3. Application of ERP demonstrated with suitable food product.
4. Familiarization with software related to food industry.
5. Visit to industries and Knowledge of computer application in food industry.
6. Actual presentation of report in seminar.
7. Documentation of any food product along with relevant labelling.

CODE: FDPB1104T		BASICS OF FOOD PROCESSING
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OBJECTIVES

- Students will learn about the basics and requirements for processing of food.
- Learners will identify and perform different kinds of food processes such as Milling, Cooking, Boiling, Frying, Baking, Fermentation etc.
- Learners will gain knowledge about various physical food preservation methods such as High and Low temperature, Drying, Radiation.
- Students will evaluate various chemical food preservation methods such as Fermentation, Smoking and use of chemical preservatives.
- Learners will perform blanching and evaluate effects of browning on seasonal fruits and vegetables.
- Learners will demonstrate effects of heat and acidity on proteins.
- Students will perform sterilization of milk by pasteurization and its effectiveness.

Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Introduction to Food Processing: Definition, Objectives, scope of food processing industries, Introduction to Different processes employed in food processing viz. Milling, Cooking, Boiling, Steaming, Braising, Stewing, Roasting, Frying, Grilling, Baking, Fermentation, Pickling, Refining.
2. Food Preservation I: Heat: Evaporation, boiling, parboiling, steam under pressure, pasteurization, blanching, canning). Low Temperature: (Thawing, refrigeration, cold storage, de-hydro freezing): Drying (Methods of drying – dehydration by Air drying, sun drying and freeze drying) Radiations: (Ultraviolet and ionizing irradiations).

SECTION-B

3. F

ood Preservation II: Preservation by fermentation – Curing and Pickling; Smoking Chemical preservatives-(Objectives, principles, types of preservatives, Different types of chemical preservatives,Safety in use and certification levels,Preservation by high osmotic pressure(Pickling, salting, curing – principles)

4. Methods in Food Processing - Microwave processing, Extrusion cooking, Ohmic Heating, Reverse Osmosis, Electro dialysis, Ultra-filtration, High Pressure Processing,Super critical fluid extraction

REFERENCES

1. Jood, Sudesh, 2002, Food Preservation, Agrotech Publisher Academy, Udaipur.
2. Potter, N.N., 2002, Food Science, CBS Publishers, ND.
3. Sethi, Mohini, 2001, Food Science, CBS Publishers, ND.
4. Srilakshmi, B., 2001, Food Science, New Age International Pvt. Ltd., ND.
5. Mahendru, S.N., 2000, Food Additives, Tata McGraw Hills, ND.
6. Manay, N.S., 2001, Foods: Facts & Principles, Wiley Eastern Ltd., ND.
7. Fellows, P., 2005, Food Processing Technology: Principles & Practices, CRC Press, Woodhead Publishing Ltd., England.
8. Chakraverty, A., 2000, Postharvest Technology of Cereals, Pulses & Oilseeds, Oxford & IBH Publishing Co. Pvt. Ltd.,
9. Wildey, R.C. Ed. 1994. Minimally Processed Refrigerated Fruits and Vegetables. Chapman and Hall, London.
10. Lewis, M.J. 1990. Physical Properties of Food and Food Processing Systems. Woodhead, UK.
11. Jelen, P. 1985. Introduction to Food Processing. Prentice Hall, Reston Virginia, USA.
12. Arsdel W.B., Copley, M.J. and Morgen, A.I. 1973. Food Dehydration, 2nd Edn.(2 vol. Set). AVI, Westport.
13. Bender, A.E. 1978. Food Processing and Nutrition. Academic Press, London.

PRACTICALS: FDPB1103L

M.M. 45

1. To blanch a seasonal fruit or vegetable & assess quality of blanching process.
2. To study the effect of browning on raw fruits & vegetables.
3. To study effect of heat and acidity on milk proteins.
4. To study the effectiveness of pasteurization.
5. To study Pasteurization of milk using microwave technique.
6. To study different methods of food processing i.e. by heat, low temperature & drying on a given food sample.
7. To check the shelf life of a given food at ambient temperature and under refrigeration.
8. Bacteriological estimation of milk by MBRT.

OBJECTIVES:

- Students will learn about the basics of dairy processing.
- Students will evaluate composition of milk, principles & methods of milk processing.
- Learners will gain awareness about microbiology of milk & milk products.
- Students will learn about processed milk products such as toned milk, flavoured milk, etc.
- Students will get the knowledge about the preparation & principles of paneer, cheese, curd, ice-cream etc.
- Students will develop understanding about the importance of dairy industries, and roles & responsibilities of a dairy product processor in a dairy plant.
- Learners will perform experiments to determine SNF%, fat content, specific gravity, TS% and casein content of milk.
- Learners will prepare various food products made from milk such as curd, cream, buttermilk, ice cream and paneer and check their quality.
- Learners will perform experiments to check sterility of milk and study various physiochemical properties and microbiological standards of milk.

Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Definition of milk; Chemical composition of milk Principle and methods of milk processing (Filtration, Clarification, Pasteurization, Homogenization, Sterilization) Microbiology of milk & milk products. The process of testing milk for accepted quality standards; organoleptic testing of milk
2. Types of processed milk: pasteurized, toned, flavoured & fermented milk, infant milk, milk powder, Preparation methods and principles of Paneer, cheddar Cheese, Curd, Yoghurt Process for producing dairy products: lassi, flavoured drink, kalakand, ice-cream, butter, cooking butter, ghee, fermented milk, condensed milk

SECTION-B

3. Importance of dairy industry. Various units within a dairy processing plant. Need for processing milk. Handling and operating of machineries used in a dairy processing plant: Homogenizer, pasteurizer, sterilizer, spray drier, drum drier, plate heat exchanger, evaporators, cream separator, ice cream-freezer, Gerber centrifuge, form fill seal machine, cheese making machine and equipments
4. Roles and responsibilities of a dairy products processor in a dairy processing plant. Trends in cleaning and sanitization of dairy equipment: biological; detergents; Automation; Ultrasonic techniques in cleaning; bio-detergents, development of sanitizers- heat; chemical; radiation, mechanism of fouling and soil removal; Bio-films, assessing the effectiveness of cleaning and sanitization of dairy products.

REFERENCES

1. De, Sukumar, 1991, Outlines of Dairy Technology, Oxford Univ. Press, ND
2. Walstra, P., 2005, Dairy Technology, Oxford Univ. Press, ND. Milk & Milk Products by Eckles, Combs, Henery C, and Willes C, 1997, Tata McGraw Hill Publishers, USA.
3. Warner JN, 1976, Principles of Dairy Processing, Wiley Science Publishers, USA.
4. Herrington BL; 1948, Milk & Milk Processing; McGraw-Hill Book Company.
5. Lampert LH; 1970, Modern Dairy Products, Chemical Publishing Company.
6. Developments in Dairy Chemistry – Vol 1 & 2; Fox PF; Applied Science Pub Ltd.
7. Outlines of Dairy Chemistry, De S; Oxford.
8. Richardson and Mead. 1999. Poultry meat science.
9. Pearson and Tauber. 1989. Muscle and meat biochemistry.
10. Pearson and Dutson. 1994. Quality attributes and their measurement in meat poultry
11. Romans. JR and Costillo WJ, Carlson WC, Greaser ML and Jones KW, 2004, The Meat We Eat, Interstate Publishers, USA

PRACTICALS: FDPB1104L

M.M.45

1. Determination of specific gravity, SNF % and TS% of milk.
2. Estimate the milk fat by Gerber method.
3. To determine the Casein content of the milk.
4. To check the sterility of milk by Turbidity test.
5. To prepare a chart of physico–chemical properties and microbiological standards of milk and milk products.
6. Preparation of dahi, cream, buttermilk and paneer.
7. T _____

- o prepare ice cream, testing of its quality
- 8. Phosphatase test to check pasteurization of milk.
- 9. Platform tests of milk like organoleptic tests, clot on boiling test, alcohol test, pH and % acidity test- Alizarin Alcohol test.
- 10. Detection of various adulterants and neutralizer in milk
- 11. To determine percentage of overrun of ice-cream.
- 12. Analysis of ice cream for fat, % acidity, total solids, foreign fat
- 13. Demonstration on form fill seal machine
- 14. To study various parts of cream separator
- 15. To analyze quality of butter and ghee sample
- 16. Preparation and quality valuation of spray dried milk
- 17. Bacteriological estimation of milk by MBRT

CODE: FDPB1201T	PUNJABI-II (Qualifying)
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CODE: FDPB1202T

HOLISTIC DEVELOPMENT I-PERSONALITY DEVELOPMENT

OBJECTIVES:

- Student will identify the Personality Patterns, Personal Effectiveness and Personality Determinants.
- Students will evaluate Interpersonal Relations, Analysis of Relations of different ego states and Analysis of Strokes.
- Student will learn the importance of stress management and time management.
- Learners will perform individual and group activities to combat stress and anger.
- Learners will practice collaborative learning and undergo interactive sessions for time management.
- Students will experience empirical learning for personality traits and perform various tests of personality.
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Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER: The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

- 1.Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Personality: Meaning & Concept, Personality Patterns, Symbols of Self, Moulding the Personality Pattern. Personality & Personal Effectiveness. Personality Determinants: An overview of Personality determinants. Evaluation of Personality: Sick Personalities and Healthy Personalities.
2. Introduction to Interpersonal Relations, Analysis of Relations of different ego states, Analysis of Strokes, Analysis of Life position, Introduction to Motivation, Relevance and types of Motivation, Motivating others

SECTION-B

3. Stress Management: Introduction to Stress, Causes of Stress, Impact of Stress, Managing Stress, Conflict Management: Introduction to Conflict, Causes of Conflict, Managing Conflict
4. Time Management: Time as a Resource, Identify Important Time Management Wasters, Individual Time Management Styles, Techniques for better time management.

REFERNCES

1. Lall& Sharma – Personal Growth Training& Development (Excel Books)
2. Janakiraman- Training& Development (Biztantra)
3. Hurlock., Elizabeth B - Personality Development (Tata McGraw Hill, 1st Ed.)
4. Sahu R..K. - Training for Development (Excel Books, 1st Ed.)
5. Prof. Achhru Singh & Dr. Dharminder Singh Ubha, Personality Development and Soft Skills.
6. Petri, H.L. and Govern, J.M., 2013, Motivation: Theory, Research, and Applications, (sixth edition) Wadsworth Cengage Learning: Belmont CA.
7. Stephen Robbins, Organisational Behaviour .
8. Keith & Davis, Organisational Behaviour.
9. Fred and Luthans, Organisational Behaviour.
10. K.A. Ashwatthapa, Organisational Behaviour.

PRACTICALS: FDPB1201L

M.M.45

1. Group activities + individual activities to resolve stress and conflict.
2. Collaborative learning for time management.
3. Interactive sessions based on time management.
4. Ensure Participation for personality development
5. Empirical Learning for personality traits.
6. To perform different personality tests
7. Personality Inventory administration.
8. Adjustment Inventory administration.

CODE: FDPB1203T

BASICS OF FOOD PACKAGING

OBJECTIVES:

- Students will learn about the basics of food packaging and designing of packages for various foods.
- Students will evaluate various packaging materials such as cellulose films, plastic films, aluminium foils and laminations.
- Students will develop knowledge of food packages bags, pouches, carton boxes, metal cans, and plastic & glass containers.
- Student will have understanding of packaging methods such as vacuum, gas, shrink and retort pouches, polyvinylchloride, polystyrene and inert gas packaging.
- Student will learn and practice packaging of cereals, fruits, vegetables, milk and milk products.
- Learners will conduct experiments to determine grease resistance and chemical resistance, water paper transmission rate and porosity of different packaging materials.
- Learners will evaluate the shelf life of packaged food.

Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

Section-A

1. Packaging - Introduction, Food Protection, functions of package, design of packages for various foods. Development of protective packaging- paper and paper boards.
2. Regenerated cellulose film, plastic films, Aluminium foils and laminations. Edible packaging, Food packages bags, pouches, carton boxes, metal cans, plastic containers, glass containers.

Section-B

3. Special packaging methods- vacuum and gas packaging, shrink package, retort pouches, Biodegradable

packages. Flexible packaging materials: polyethylene, cellophane, PVC, Polystyrene, Inert gas packaging.

4. Packaging of cereals, fruits and vegetables, milk and milk products and meat and meat products.

REFERENCES

1. Sachrow & Griffin, "Food packaging".
2. Heiss R., "Principles of food packaging".
3. Paine E.A, "Fundamentals of packaging".
4. Day P.T., "Packaging of food beverages".
5. Brody AL, "Flexible packaging of Foods".
6. Gordon L. Robertson. Marcel Dekker. 1993, Food Packaging: Principles and Practice.
7. M. T. Crosby, Food Packaging Materials.
8. M. Mahadevish R.V. Gowramma, Food Packaging Materials.
9. Stanley Sacharow, Food Packaging.

PRACTICALS: FDPB1202L

M.M: 45

1. To determine grease resistance of packaging materials.
2. Determination of water vapour transmission rate of various packaging materials.
3. To find out the porosity of tin plate.
4. To find out the tin coating weight.
5. To find out the uniformity and amount of wax on wax paper.
6. To see the chemical resistance of packaging material.
7. Shelf life studies of packaging foods.
8. Puncture resistance of corrugated boxes.
9. Visit to various industries, dealing with food packaging materials like / paper, board and m

CODE: FDPB1204T	INTRODUCTORY FOOD MICROBIOLOGY
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OBJECTIVES:

- Students will learn the uses of microorganisms for preparation of various types of foods such as bread, c

urd etc.

- Students will gain awareness about the interaction between microorganism and the food environment and factors influencing the growth and survival.
- Students will develop knowledge about the characteristics of food borne, waterborne spoilage microorganism and methods for their isolation, detection and identification.
- Students will evaluate the effects of fermentation in food production and its influences on the quality and status of food.
- Students will practice different standard methods and procedures for the microbiological analysis of food.
- Students will be able to demonstrate the working of autoclave, laminar airflow and microscope.
- Students will perform cleaning and sterilization of plastic ware and glassware.
- Students will prepare and sterilize nutrient media.
- Students will perform culturing of microbes on media and identify their morphological features using various staining methods.

Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Introduction to Food Microbiology ,Important terms related to Food Microbiology , physical, chemical and microbiological parameters for hygienic production of food, Safety Regulations for the Food Microbiology Laboratory
2. Types of microorganisms, Classification and Nomenclature ,Morphology and Structure and their importance in food(bacteria, fungi, viruses,molds,yeast), Microscopy, use of compound microscope,

SECTION-B

3. Microbial Growth in Food , Microbial Growth Characteristics- Bacterial growth curve Factors affecting the growth of micro-organisms, Sources of Microorganisms in foods, list of Some important food spoilage bacteria. Changes caused by micro-organisms
4. Cultivation of Micro-organisms : Methods of isolation and cultivation, Pure culture techniques (Streak plate, spread plate and serial dilution method), Hygienic handling of Food

PRACTICALS: FDPB1203L

M.M. 45

1. Introduction to Food Microbiology and Laboratory Safety
2. Use of autoclave, Laminar air flow/ Functioning and use of compound microscope
3. Cleaning and sterilization of glassware
4. Preparation and sterilization of nutrient broth
5. Cultivation and sub-culturing of microbes
6. Preparation of slant, stab and plates using nutrient agar
7. Morphological study of bacteria and fungi using permanent slides
8. Simple staining, Gram Staining, Negative staining
9. Standard Plate Count of Milk and Foods
10. Heat, Cold and Other Stress Factors Affecting Microbial Growth
11. Isolation and Identification of *Escherichia coli*

REFERENCES

- 1) Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
- 2) Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- 3) Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- 4) Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993
- 5) Essentials of Microbiology; K. S. Bilgrami; CBS Publishers, Delhi
- 6) Basic Food Microbiology; Bannett, Chapman and Hall
- 7) Food Microbiology; M. R. Adams 7. Hand Book of Microbiology; Bisen

CODE: FDPB1205T	FOOD PRODUCTS PACKAGING TECHNOLOGY
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OBJECTIVES:

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tudents will identify different types and categories of packaging material.

- Students will gain the information about packaging requirements for various food products.
- Students will acquire knowledge about evaluation of quality and safety of packaging materials.
- Students will learn about Food Safety Standards and Regulations.
- Students will have the knowledge about developments in food packaging materials.

Time Allowed: 3hrs; MM: 74; Pass Percentage: 35 %

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section C will consist of 15 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all.

INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. Types of packaging material and categories of packaging material, Types of packaging material used for packing various food products, Packaging requirements and their selection for raw and processed foods : Meat, fish, poultry, eggs : Milk and dairy products : Fruits and vegetables : Cereal grains and baked food products : Beverages : Snacks
2. Forms of packaging – box, bottle, tetra, pouch, shrink, vacuum, gas, CAP, MAP, aseptic etc. process parameters for all categories of packaging for each product, Selection of packaging material and design, Evaluation of quality and safety of packaging materials – different testing procedures. Brief Introduction to WVTR, GTR, bursting strength, tensile strength, tearing strength, drop test, puncture test, impact test

SECTION-B

3. Packaging Machinery: Bottling, can former, form fill and seal machines, bags – their manufacturing and closing, vacuum packs unit, shrink pack unit, tetra pack unit , Package labelling – functions and regulations,
4. Newer packaging technologies- CAP/MAP packaging, aseptic processing and packaging, irradiated packaging, retort pouch, microwaveable packaging, packaging standards and legislation in food packaging materials, knowledge on Food Safety Standards and Regulations (as per FSSAI), recent developments in food packaging materials.

REFERENCES

1. Gordon L. Robertson. Marcel Dekker. 1993 Food Packaging: Principles and Practice.
2. Potter, N.N. Food Science, 2006, CBS Publishers 5th Ed., SBS Publishers, New Delhi.
3. Sethi, M. 2001, Food Science CBS Publishers, ND.
4. Crosby, M. T. Food Packaging Materials.
5. M. Mahadevish, M., Gowramma. R.V. Food Packaging Materials
6. Stanley Sacharow. Food Packagin 7..E.A. Paine, Fundamentals of packaging.
8. P.T. Day, Packaging of food beverages.
9. A.L. Brody, Flexible packaging of Foods.

PRACTICALS: FDPB1204L

M.M: 45

1. Identification of different types of packaging and packaging materials
2. Identification of different types of packaging and packaging materials.
3. To perform different destructive and non- destructive test for glass containers.
4. Determination of tensile strength of given material.
5. Determination of tearing strength of paper
6. Determination of water vapour transmission rate.
7. Determination of drop test of food package.
8. Visit to food packaging industries.
9. To demonstrate vacuum and shrink packaging.
10. Demonstrate the intelligent packaging.
11. Measurement of thickness of packaging materials
12. D

etermination of wax weight

13. To perform grease-resistance test in plastic pouches
14. Determination of bursting strength of packaging material
15. Demonstration of can-seaming operation
16. Testing of chemical resistance of packaging materials
17. Show videos of latest trends in packaging consulting websites.

CODE: FDPB1206T

**DRUG ABUSE: PROBLEM, MANAGEMENT
AND PREVENTION**

**COMMON FOR ALL UNDERGRADUATE DEGREE COURSES PART-I(SEMESTER-II)
QUALIFYING SUBJECT-DRUG ABUSE:PROBLEM, MANAGEMENT AND PREVENTION**