

PUNJABI UNIVERSITY,

PATIALA, PUNJAB, INDIA

(Established under Punjab Act No. 35 of 1961)



Syllabi

for

**BACHELOR OF VOCATION (B. Voc.)
(FOOD PROCESSING)
PART 2 (Semester III & IV)**

PROGRAMME CODE: FDPB3PUP

FOR

Session 2022-23, 2023-24, 2024-25

Under

CHOICE BASED CREDIT SYSTEM

Handwritten signature and date 10/11/24

PUNJABI UNIVERSITY, PATIALA

BACHELOR OF VOCATION (B. Voc.) FOOD PROCESSING

OUTLINE OF PAPERS AND TESTS

FOR

B. Voc. FOOD PROCESSING PART –II (Semester III)

PROGRAMME CODE: FDPB3PUP

Session: 2022-23, 2023-24 & 2024-25

CODE	SUBJECTS	L	T	P	Total credits* One credit = 15hrs./1 Lecture of 1hr.	External Marks	Internal Marks	Practical Marks	TOTAL MARKS
FDPB 2101T	Communication skills	3	1	0	4	75	25		100
FDPB 2102T	Introduction to Grain Milling and Machineries	3	1	0	4	74	26		100
FDPB 2103T	Fundamentals of Food Biochemistry	3	0	0	3	74	26		100
FDPB 2104T	Introduction to Cereal and Legume Processing	3	0	0	3	74	26		100
FDPB 2105T	Fundamentals of food and nutrition	3	0	0	3	74	26		100
FDPB 2101L	Practical paper IX (pertaining to FDPB2102T)			3	3			45	45
FDPB 2102L	Practical paper X (pertaining to FDPB2103T)		0	3	3			45	45
FDPB 2103L	Practical Paper XI (pertaining to FDPB2104T)			3	3			45	45
FDPB 2104L	Practical Paper XII (Pertaining to FDPB2105T)			3	3			45	45
	Industrial Visit			1	1				20
	Total General Education Component				12				700
QP- FIC/Q10 01 (SPECIFIC JOB ROLE)	Chief Miller Level-6/for any other qualification pack of level 6 (Level 6 is of two semesters therefore evaluation shall be done after IV semester)				18				
					Evaluation will be done at the end of IV Semester by FICSI Result will be communicated to the university by college				

[Handwritten Signature]

PUNJABI UNIVERSITY, PATIALA

BACHELOR OF VOCATION (B. Voc.) FOOD PROCESSING

OUTLINE OF PAPERS AND TESTS

FOR

B. Voc. FOOD PROCESSING PART -II (Semester IV)

PROGRAMME CODE: FDPBPUP

Session: 2022-23, 2023-24 & 2024-25

CODE	SUBJECTS	L	T	P	TOTAL CREDITS* *one credit =15 hrs./1 lecture of 1 hr	External Marks	Internal Marks	Practical Marks	TOTAL MARKS
FDPB22 01T	Environmental & Road Safety Awareness (Qualifying/ as per University rules*)	3	1	0	4	70	30		100*
FDPB22 02T	Holistic Development II: Physical Training	3	1	0	4	74	26		100
FDPB22 03T	Food Spoilage and Control	3	0	0	3	74	26		100
FDPB22 04T	Quality Control and Regulations	3	0	0	3	74	26		100
FDPB22 05T	Fruits and vegetables Processing	3	0	0	3	74	26		100
FDPB22 01L	Practical Paper XIII pertaining to FDPB2202T			3	3			45	45
FDPB22 02L	Practical Paper XIII pertaining to FDPB2203T		0	3	3			45	45
FDPB22 03L	Practical Paper XIV pertaining to FDPB2204T		3	3	3			45	45
FDPB22 04L	Practical Paper XV: pertaining to FDPB2205T		3	3	3			45	45
	Industrial Visit			1	1				20
	Total General Education Component				12				600
QPEI 01 (SPECIFIC JOB ROLE)	Chief Miller/Food microbiologist/ Quality Assurance Manager/ Level-6/or any other qualification pack of level 6				18			Evaluation will be done by FICSI. Result will be communicated to the university by college	

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

SYLLABUS

FOR

B. Voc. FOOD PROCESSING

PART –II (Semester III)



Code: FDPB2101T	Communication Skills-I
------------------------	-------------------------------

Max. Marks: 75

Total lectures: 60 hrs.

English communication Skills has been designed to develop the student's communicative competence in English. Therefore, content selection is determined by the student's present and future academic, social and professional needs.

Texts Prescribed:

1. Literary Skills: Flights of Fancy (Poems 1-15)–Bakshish Singh(editor)
2. Writing Skills: The Written Word - Vandhana R. Singh

Section –A (Literary)

Attempt Any Two

1. One essay type question based on main ideas/summary of poems from “FLIGHTS OF FANCY” in about 250 words. (15 marks)
2. Short answer questions. Five to be attempted out of the given eight questions in about 50-60 words each. (5 x 3 = 15 marks)
3. Use of 15 words out of given 20 words in sentences after giving their meanings. (15 marks)
4. Explain two stanzas with reference to the context. (7.5 x 2 = 15 marks)

Section- B (Writing Skills)

Attempt Any Two

1. Letter writing (personal) (15 marks)
2. Developing one short story based on hints provided. (15 marks)
3. Writing two short passages on the given topics (Current Economic, Political and Sports Affairs). (15 marks)
4. Make 15 dialogues from a given prose passage. (15 marks)

Section- C

Attempt All

This section will cover the entire syllabus. All ten very short questions to be attempted in one sentence each. (10 x 1.5 = 15 marks)

 

Code: FDPB2102T Introduction to Grain Milling and Machineries

OBJECTIVES

- Students will gain information about the general principles and working of grain milling machinery.
- Students will learn and evaluate various properties of different flours such as moisture content, gluten content, protein content, alcoholic acidity, water absorption capacity and ash content.
- Students will identify the traditional and latest pretreatment methods in this area.
- Students will acquire knowledge about the modern and improved milling machinery utilized in the milling industries.
- Learners will undergo visit to flour and rice mills for hands on experience.

Time Allowed 3 hrs;

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. Milling of Wheat: milling preconditioning, cleaning, washing and drying, operation flow charts of domestic and commercial atta chakies, mini flour mills and roller flour mills. Modern flour mill: General Principles and machine operations – break system, reduction system, sifting, purification, flour bagging and storage and flour treatment
2. Types of maize. Milling of corn. Methods of cleaning, grading, milling. Standards for wheat flour. Production of different wheat and corn product. adulteration in flour.

SECTION-B

3. Dal milling: pre milling treatments of pulses, pulse milling and recent development. Principle of dal milling. Pulses suitable for milling. different methods of dal milling. working and principle of dal mill, pre-treatment in dal milling
4. Working with grain milling machinery: hammer mill, Groundnut decorticator hand operated, mini dal mill, mini rice mill, mini oil expeller, grain cleaner, mini grain mill, wheat flour mill, micro pulverizer and destoner

REFERENCES:

1. Kent, N.L. and Evers, A.D. 4th Edition. 1983, Technology of Cereals, Woodhead Publishing Limited, U.K.
2. Maiz, S.A. 1996, The Chemistry and Technology of Cereals as Food and Feed, CBS Publishers, New Delhi.
3. Potter, N.N. 5th Ed. 2006, Food Science, SBS Publishers, New Delhi.
4. Arota, M. 2020, Practical Manual Food Processing, Bachelor of Vocation Food processing: Part II: Semester III Nirai prakashan, Pune.
5. Durbey, S.C. 1979. Basic Baking: Science and Craft Gujarat Agricultural University, Anand(Gujrat).
6. Chakraverty, A. 1988. Post-Harvest Technology of Cereals. Pulses and Oilseeds, Oxford and IBH, New Delhi.
7. Ruth H. Matthews (1989). Pulses- Chemistry, Technology and Nutrition, Marcel Dekker Inc. USA
8. Chapman and Hall (1992). The chemistry and technology of cereals as food and feed.

PRACTICAL (FDPB2101L)

M.M. 45

1. Milling of Wheat flour.
2. Determination of Gluten content in wheat/corn flour sample.
3. To determine water absorption capacity of wheat flour/maida
4. Determination of adulterant (NaHCO_3) in wheat flour/maida
5. Determination of alcoholic acidity of the sample of wheat flour/maida
6. Visit to a working modern roller flour mill and FCI godowns.
7. Determination of wet and dry gluten of a given flour sample
8. Visit to working rice mill, collection of samples at various steps of milling and analysis for efficiency of cleaning, shelling, paddy separator and degree of polish
9. Traditional and improved pretreatments and its effect on dehiscing of some legumes
10. Estimation of moisture content of different flour using hot air oven method
11. Determination of ash content of flour.

Code: FDPB2103T	Fundamentals of Food Biochemistry
------------------------	------------------------------------------

OBJECTIVES

- Students will learn about the biochemistry of carbohydrates and proteins.
- Students will develop knowledge about enzymes: classification, features, activity, inhibition, and application of enzymes in food industry.
- Students will acquire knowledge about lipid peroxidation and its mechanism, and antioxidant types and functions.
- Students will gain awareness about food additives and their importance in food industry.
- Learners will perform experiments to determine TSS, acidity, pH, acid value, vitamin C content, protein content, fat content and ash content of given food sample.

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. **Carbohydrates:** Changes in carbohydrates on cooking, browning and Maillard reaction, metabolic pathways (Glycolysis). Proteins: Sources of proteins; Enzymatic and non-enzymatic browning, Texturization- spin and extrusion process.
2. **Enzymes:** Enzymes classification, Enzyme specificity, coenzymes, cofactors, factors affecting enzyme activity, Enzyme kinetics, Lineweaver-Burk plot, Enzyme inhibition and application of enzymes in food technology.

SECTION-B

3. **Lipid peroxidation:** Mechanism and inhibition-enzymatic and non-enzymatic, antioxidants in foods; Types and function.
4. **Food additives:** Flavor enhancers (monosodium glutamate, 5-nucleotides and malol). Pigments: Introduction and significance of natural pigments in food - Chlorophylls, Carotenoids, Anthocyanins, Flavonoids, Tannins.

REFERENCES:

1. G.A. Tucker and L.F.J. Woods, 1995, Enzymes in Food Processing, Blackie Academic & Professional, USA.
2. H.D. Belitz, W. Grosch and P. Schieberle, Springer Verlag, Berlin (2004), Food Chemistry.
3. D.D. Miller, Wiley-Blackwell, 2014, Food Chemistry: A Laboratory Manual, USA .
4. L.W. Aurand, A.E. Woods and M.R. Wells, 1987, Food Composition and Analysis, AVI Publishers, USA .
5. D.W.S. Wong, Chapman & Hall, UK (1995), Food Enzymes: Structure & Mechanism.
6. N.N. Potter and J.H. Hotchkiss, Springer, Netherlands 1999, Food Science.
7. M.I. Gurr, J.L. Harwood and K.N. Frayn, 2002, Lipid Biochemistry: An Introduction, Blackwell Science Ltd., UK.
8. J.M. de Man, 1999, Principles of Food Chemistry, AN ASPEAN Publication, USA.

PRACTICAL (FDPB2102L)

M.M. 45

1. Determination of TSS value of given food product.
2. Determination of acidity of food products.
3. Determination of pH of food product.
4. Determination of acid value in given oil.
5. Estimation of salt content in given food stuff.
6. Determination of vitamin C by titration method.
7. Determination of Protein by Kjeldhal method.
8. Determination of fat by Soxhlet apparatus.
9. Qualitative estimation of sugars.
10. Determination of ash content.

Code: FDPB2104T	Introduction to Cereal and Legume Processing
------------------------	-----------------------------------------------------

OBJECTIVES

- Students will learn about the structure and chemical composition of cereals such as wheat and rice.
- Students will gain knowledge about role of wheat flour milling, extraction rate and millingsystems.
- Students will develop knowledge about structure and chemical composition of pulses and pre-treatments of pulses before milling.
- Student will experience working of machinery and equipment's employed in milling industry andtraditional milling process.
- Learners will perform milling of wheat flour and determination of its gluten content.
- Learners will prepare chapatis, bread, cakes, biscuits and fried snacks.
- Students will identify different pulses and prepare germinated foods.
- Students will practice parboiling of rice and maling of barley.

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. Structure and chemical composition of cereals – Wheat and Rice
2. Wheat flour milling, extraction rate and milling systems. Improvers and bleaching used in flour. Milling and preparation of Paddy, Rice Bran Oil. Parboiling of rice

SECTION-B

3. Introduction and brief description of pulses, Structure and chemical composition of pulses (moong, mash, lentil, gram beans, cowpea), Pretreatments given to pulses before milling.
4. Working of machinery and equipment employed in milling industry. Traditional milling process- merits and demerits, Drying of legumes- sun drying, pre-cleaning, oil application, conditioning, dehushing and splitting. Grinding of split pulses, pulse flour products and their applications.

 

REFERENCES:

1. Kent, N.L. and Evers, A.D. 4th Edition. 1983, Technology of Cereals, Woodhead Publishing Limited, U.K.
2. Maiz, S.A. 1996, The Chemistry and Technology of Cereals as Food and Feed, CBS Publishers, New Delhi.
3. Potter, N.N. 5th Ed. 2006, Food Science, SBS Publishers, New Delhi.
4. Durbey, S.C. 1979. Basic Baking: Science and Craft Gujarat Agricultural University, Anand(Gujrat).
5. Chakraverty, A. 1988. Post-Harvest Technology of Cereals. Pulses and Oilseeds, Oxford and IBH, New Delhi.
6. Ruth H. Matthews (1989). Pulses- Chemistry, Technology and Nutrition, Marcel Dekker Inc. USA
7. Chapman and Hall, 1992, The chemistry and technology of cereals as food and feed.

PRACTICAL (FDPB2103L)

M.M. 45

1. Milling of Wheat flour.
2. Determination of Gluten.
3. Preparation of chapatis, bread, biscuits and cakes.
4. Parboiling of Rice
5. Determination of crude fiber, ash, protein and fat.
6. Study of maling of Barley.
7. Identification and description of common pulses.
8. Preparation of fried snacks and baked goods
9. Preparation of germinated foods.
10. Visit to food industry



Code: FDPB2104T	Fundamentals of Food and Nutrition
-----------------	------------------------------------

OBJECTIVES

- Students will learn definition and classification of food.
- Students will develop understanding about carbohydrates, proteins, fats, vitamins and minerals.
- Students will have information about nutritive value of different food groups.
- Students will gain knowledge about effects of deficiency & overconsumption of different nutrients.
- Learners will interpret nutritional information in different packed foods available in the market.
- Learners will conduct experiments to determine iodine value, acid value, saponification value and lipid composition of wheat grain.
- Students will perform qualitative and quantitative determination of carbohydrates and proteins in food.
- Students will evaluate and prepare diet chart for normal physiological conditions.
- Students will identify Dietary allowances and standards for adult man/woman, pre-school children, adolescents, old age people and athletes

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 Food: Definition, classification, and constituents of food: Carbohydrates, Fats, Proteins, Fat soluble vitamins- (A, D, E and K) Water soluble vitamins – (Thiamin, Riboflavin, Niacin, Pyridoxine, Folate, Vitamin B12 and Vitamin C) Minerals – (Calcium, Iron, Zinc, Iodine and Flourine).
2. Nutritional Concept in Food Design: Nutritive values of cereals, pulses, oil seeds, fruits vegetables, fish, meat, and eggs

SECTION-B

3. Functions of food, Effect of deficiency & overconsumption of dietary sources on health, Basic food groups, Recommended Dietary Allowance (RDA), Food guide pyramid,

 

Dietary fibers, Functions of water in body. . Balanced Diet: Definition, food groups used in planning balanced diets.

4. Nutrition: Basic terms used in nutrition, relationship between food, health and nutrition, bioavailability of nutrients. Basal Metabolic Rate (BMR). Protein quality, Dietary allowances, and standards for different age groups: adult man/woman, pre-school children, adolescent children, pregnant woman. geriatric nutrition, nutrition for athletes

REFERENCES:

1. N. Shakuntala Manay & M. Shadaksharaswamy Food Facts and Principles by New Age International (P) Ltd. Publishers.
2. N. Potter & J. Hotchkiss, Food Science CBS Publisher and Distributors.
3. Manoranjan Kalia and Sagita Sood, Food Preservation and Processing by Kalyani Publishers.
4. Shubhangini Joshi, Nutrition and Dietetics Tata McGraw Hill Co. Ltd.
5. M. Swaminathan, Vol-I Food and Nutrition , Bangalore Printing and Publishing Co.
6. Gopalan C, Rama Sastri BV, Balasubramanian SC. 1989. Nutritive Value of Indian Foods. National Institute of Nutrition, ICMR, Hyderabad.
7. Wardlaw and Insel MG, Insel PM. 2004. Perspectives in Nutrition. Sixth Edition, McGraw Hill.
8. Srilakshmi B 2012. Nutrition Science. 4th Revised Edition, New Age International Publishers.
9. Khanna K, Gupta S, Seth R, Passi SJ, Mahana R, Puri S. Textbook of Nutrition and Dietetics. Phoenix Publishing House Pvt. Ltd.
10. ICMR. 2010. Recommended Dietary Allowances for Indians. Published by National Institute of Nutrition, Hyderabad
11. Antia, F.P. and Abraham, P. 2011: Clinical Dietetics and Nutrition, Fourth Edition, Oxford University Press.
12. Joshi, V.D. 2005: Handbook of Nutrition and Dietetics, Vora Medical Publications, Mumbai.
13. Masih, S. 2011. Essentials of Food and Nutrition, Lotus Publishers.
14. Sharma, R. 2011: Diet Management, Fourth Edition, Elsevier, A Division of Reed Elsevier India Private Limited.

PRACTICAL (FDPB2104L)

M.M. 45

1. To study nutritional information in different packed foods available in the market.
2. Estimation of iodine value of fats and oils.
3. Determination of acid value of fat.
4. Estimation of saponification value of fat.
5. Lipid composition of wheat grain.
6. Qualitative and quantitative determination of carbohydrates in food
7. Qualitative and quantitative determination of proteins in food
8. Planning of diet chart for normal physiological conditions.
9. Preparation of scrap files showing overconsumption and deficiency of different food components.

SYLLABUS

B. Voc. FOOD PROCESSING

PART –II (Semester IV)



2024/

Code: FDPB2201T	Environmental & Road Safety Awareness
-----------------	---------------------------------------

COMMON FOR ALL UNDERGRADUATE DEGREE COURSES PART-II
(SEMESTER-IV)

QUALIFYING SUBJECT: ENVIRONMENTAL & ROAD SAFETY AWARENESS



Code: FDPB2202T Holistic Development-II (Physical Training)

OBJECTIVES

- Students will develop understanding about sports relationships and sports performance in India.
- Students will gain knowledge about sports injuries and first aid, sports psychology and anxiety.
- Learners will identify and evaluate rules and regulations of different games such as badminton, discuss throw and high jump.
- Learners will perform the measurement and preparation of the field.
- Students will identify different requirements for game such as equipment's, materials and technique.
- Students will be able to demonstrate duties of officials, knowledge of score sheet and signals of officiating.

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. **Sports relationship:** Role and importance of sports and economy, sports and politics.
2. **Sports performance:** Causes and remedial measures of India's poor performance in Sports.
3. **Sports injuries:** - Causes symptoms, first aid, treatment and prevention of (Sprain, Strain, contusion, dislocation & fracture).
4. **First Aid:** -Meaning, principles and qualities of first aider. First aid for dislocation, burns, electric shock, drowning and heat stroke.

SECTION-B

5. **Sports Psychology:** -Meaning and Importance in Physical education and sports and competition. Psychological factors affecting physical performance.
6. **Anxiety and Aggression:** Meaning and remedial measure of anxiety and aggression in sports.
7. **Badminton:** History, layout, General rules and regulation, officials, Major tournaments, and Arjuna awardees.
8. **Discuss Throw:** Rules and regulations, Layout and Technique.
9. **High Jump:** Rules and regulations, Layout and Technique.

REFERENCES:

1. Kang G.S. Deol N.S, 2008, An introduction to Health and Physical Education, 21st Century, Patiala.
2. Blair, Jones, and Simpson; 1962, Educational Psychology, The Macmillan Co., New York,
3. Lindgren, H.E., 1962, Educational Psychology in the class Room, John Wiley & Sons,
4. Whiting HTA; 1972, Reading in sports Psychology, Henry Kimpton Publisher, London.
5. Dhalwal, A.S. Vidyak Manovidyan, Patiala. Punjab University.
6. Puri, A.T. 1980, Sports Psychology: An abridged translation by G.S. Sandhu, NIS Patiala.
7. Suin, R.M, 1982., Psychology in Sports, Methods and applications, Surjit Publications, New Delhi.
8. Ajmer Singh and Jagtar Singh, 2004, Gill: Essentials of Physical education and Olympic movement, Kalyani Publishers, Ludhiana..
9. Swami Siranander: 1978, The Science of Paranyama, Divine life society P.O. Shivananda Nagar.Dist. Tehri Garhwal, U.P.
10. Yogendra, 1975, Facts about, Kovalaya, Dhama, Lonavala Bombay
11. Bucher Olsen and Willgoose; 1976, The Foundation of Health, Prentice Hall Inc. Englewood Cliffs, New Jersey.
12. Turner Sellery and Smith, 1961, School Health and Health Education. The C.V. MOS by Company St.Louis.
13. Ajmer Singh and Jagtar Gill, 2004, Essential of Physical Education and Olympic Movement. Kalyani Publishers, Ludhiana.
14. Arora, M. 2020, Practical Manual Food Processing. Bachelor of Vocation Food processing: Part II: Semester IV Nirali Prakashan, Pune.
15. G.S.Kang:-Anatomy, Physiology and Health Education, Published by Publication Bureau, Punjab University, Patiala.

PRACTICAL (FDPB2201L)

M.M. 45

BADMINTON, DISCUSS THROW and HIGH JUMP

Evaluation will be based on skill test, performance & viva voce. Contents to be covered during the practical sessions:

- 1 Measurement of the field and preparation of the field.
- 2 Equipment and Materials of the game/ Event.
- 3 Fundamental skill and lead up game techniques.
- 4 Rules and Regulations of the game/ Event.
- 5 Officiating:
 - (i) Duties of officials.
 - (ii) Knowledge of score sheet.
 - (iii) Signals of officiating

Code: FDPB2203T Food Spoilage and Control

OBJECTIVES

- Students will learn about various components of microscope and its principle.
- Students will gain information about spoilage of food by various microorganisms.
- Students will have knowledge about food adulteration.
- Students will evaluate major causes of food spoilage such as various physical, chemical and microbiological.
- Students will develop knowledge about bacterial and non-bacterial food born diseases.
- Learners will develop understanding about laboratory orientation and familiarization with various laboratory instruments.
- Learners will perform various techniques to isolate and identify microorganisms from food samples.
- Students will practice drying /Freezing of given food material.

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. Microscope and microscopy -Principles and types of different microscopes, staining and staining techniques, Control of microorganisms, Control of enzymes & other factors.
2. Food preservation; Principles and methods of food preservations (Physical; Drying, Freezing, Irradiation& Chemicals; Nitrites, Nitrates Sulphites, Sulphates and Antibiotics); Food adulteration, methods of evaluation of food adulterants

SECTION-B

3. Food Contamination and spoilage: Major Causes of food spoilage (Physical, Chemical and Microbiological) Spoilage of fruits and vegetables, meat and meat products, fish, eggs, milk and milk products and canned foods.

(Handwritten signature and date 27/11)

4. Food borne Diseases: Bacterial food borne diseases (*Salmonella*, *Enterohemorrhagic E. coli*, *Listeria monocytogenes*, *Staphylococcus aureus*, *Clostridium botulinum*, *Clostridium perfringens*, *Bacillus cereus*), Nonbacterial Food borne diseases (Mycotoxin, Aflatoxin, Patulin, Ochratoxin).

REFERENCES:

1. James M Jay, Modern Food Microbiology , CBS Publishers New Delhi
2. Pelczar, Chan & Krieg; Microbiology, Tata-McGrawHill Pub
3. Stanier, R.Y. Adelberg, E.A. and Ingraham, J.L. (1984), General Microbiology, IV edn MacMillan Press.
4. Prescott. L.M. Harley J.P. and L. Kreig D.A. (1990). Microbiology, WCB Publishers.

PRACTICAL (FDPB2202L)

M.M. 45

1. Laboratory orientation and familiarization with Laminar air flow, analytical balance, oven, incubator, colony counter, autoclave, laboratory shaker
2. Demonstration of compound microscope
3. To perform simple, negative, grams staining techniques
4. To perform streak plate and spread plate techniques
5. Isolation of microorganism from food samples.
6. To perform drying /Freezing of given food material.
7. To analyze adulterants in given food material.



Code: FDPB2204T Quality Control and Regulations

OBJECTIVES

- Students will learn about good laboratory practices and Good manufacturing practices.
- Students will have knowledge about role and importance of different food regulatory authorities in India.
- Students will evaluate the need, scope and limitations of labeling and its components, regulation of labeling of irradiated products and organic foods, legal issues involved in labeling, and basics of Indian drug and cosmetics Act.
- Student will gain knowledge about biosafety guidelines for research.
- Learners will identify and evaluate ISO 22000 certified Indian companies.
- Learners will gain awareness about concept of HACCP, FSSAI-2006 and GMP.

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. Good laboratory practices and good manufacturing practices. Safety practices in the production areas.
2. Role of regulatory authorities in India - functioning, legal acts and their enforcements
Concept of HACCP - Hazard assessment, ISO 22000 regulations, FSSAI-2006, BIS, AGMARK & FDA

SECTION-B

3. Need, scope and limitations of labelling - components of labelling and regulations of labelling of irradiated products, organic foods, Legal issues involved, Indian drug and cosmetics Act.
4. Biosafety guidelines for research, environmental aspects of GMOs, handling and disposal of laboratory organisms.

REFERENCES:

1. Bare Act, Indian Patent Act 1970 Acts & Rules, Universal Law Pubs. Ltd., 2007.
2. Information Solution Pvt.Ltd., 2007.
3. G.C. McLaujlin, Total Quality in Research and Development.
4. Ralph Early, Guide to Total Quality Management.
5. Feighan Baum., Total Quality Management.
6. Duncan, Total Quality Management.
7. J. Woodali, Total Quality in Information Systems and Technology.
8. R Early, Blackie Academic, NY, 1995, Guide to Quality Management Systems for the FoodIndustry.
9. Kankanala C., Genetic Patent Law & Strategy, 1st Edition, Manupatra

PRACTICAL (FDPB2203L)

M.M. 45

1. A brief about ISO 22000 certified Indian companies.
2. To study the concept of HACCP.
3. To study the essential elements of GMP.
4. To study biosafety guidelines.
5. To study the safety practices in production area.
6. Study of FSSAI-2006.



Code: FDPB2205T	Fruits and Vegetable Processing
------------------------	----------------------------------------

OBJECTIVES

- Students will identify and classify various types and classification of fruits and vegetables.
- Students will understand the physiological changes occurring in fruit and vegetables during harvesting and storage.
- Students will familiarize with processing techniques used for fruits and vegetables.
- Students will establish the quality specification for the processing of fruit and vegetables.
- Students will develop a detailed understanding of the different fruits and vegetables techniques like canning, freezing, drying, pickling and squash making.
- Learners will prepare jams, jellies, juices, pickles, tomato ketch-up, sauce, chutney, potato chips and finger chips from fruits and vegetables.
- Students will evaluate organoleptic properties of fruits & vegetables.
- Learners will determine firmness, moisture content, starch content, TSS and viscosity of different fruits and vegetables.

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. Chemical composition, post harvest changes, Preparing fruits and vegetables for processing.
2. Natural, Ventilated and controlled atmosphere storage, Low temperature storage, Fruit & Vegetable processing plant layout and processing line, Fruit & Vegetable product quality standards & quality control measures.

SECTION-B

3. Chemical composition, post-harvest changes, Preparing fruits and vegetables for processing.
4. Natural, Ventilated and controlled atmosphere storage, Low temperature storage, Fruit & Vegetable processing plant layout and processing line, Fruit & Vegetable product quality standards & quality control measures.

REFERENCES:

1. Srivastava, R.P. and Kumar, S. 1998. Fruit and Vegetable preservation: Principles and Practices. 2nd Ed. International Book Distributing Co. Lucknow.
2. Salunkhe, D. K. and Kadam, S.S. Ed. 1995. Handbook of vegetable Science and Technology, Production, Composition, Storage and Processing. Marcel Dekker, New York.
3. Dauby, M.E. 1997. Fruit and Vegetable processing. International book Distributing Co. Lucknow, India.
4. Lai, G. Siddappa, G. and Tondon, G. L. 1986. Preservation of Fruit and Vegetables, Indian Council of Agricultural Research, New Delhi

PRACTICAL (FDPB2204L)

M.M. 45

1. Preparation of jams and jellies from different fruits.
2. Extraction and preservation of Fruit Juices.
3. To prepare different types of pickles (sweet & sour).
4. Organoleptic evaluation of fruit & vegetable products.
5. Estimation of Ascorbic Acid content spectrophotometrically.
6. Determination of Brix : Acid ratio of fruits and vegetable products
7. Testing Pectin in fruit juices and pulp.
8. Drying by different methods of fruits and vegetables.
9. Preparation of tomato ketch-up, sauce & chutney.
10. Preparation of potato chips, finger chips Utilization of waste for preparation of different products like vinegar, starch, pectin.
11. Determination of firmness of seasonal fruit by penetrometer.
12. Determination of moisture content of processed fruit/vegetable product.
13. Determination of starch content of apples/potatoes.
14. Determination of total soluble solids by refractometer.
15. Determination of viscosity of different food products.