



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM
B.Voc Food Technology Syllabus (w.e.f:2020-21A.B)

BVoc PROGRAM (4 Years Honors)

Draft Proforma for Syllabus framing

2020-21 onwards



B. Vocation

FOOD TECHNOLOGY

Members of BOS (Contact details)

Members of BOS (Contact details)		



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM
B.Voc Food Technology Syllabus (w.e.f:2020-21A.B)

Skill Enhancement Courses (SECs) for Semester -V,
From 2022-23(Syllabus-Curriculum)

Structure of SECs for Semester-V

(To choose One pair from the Four alternate pairs of SECs)

S. No	Name of the Course	Course Type (T/L/P)	Hours/week (Sciences 4+2)	Credits (Science 4+1)	Conti - Assess	Univer sity Exam	Total
I	Chemistry (Common Subject from Bsc)	T	4	4	25	75	100
1	Chemistry Practical	L	2	1	0	50	50
2	Chemistry	T	4	4	25	75	100
3	Chemistry Practical	L	2	1	0	50	50
4	Cereal Processing	T	4	4	25	75	100
5	Cereal Processing Practical	L	2	1	0	50	50
6	Processing of Meat and Meat Products	T	4	4	25	75	100
7	Processing of Meat and Meat Products Practical	L	2	1	0	50	50
8	Processing of Spices and Plantation Crops	T	4	4	25	75	100
9	Processing of Spices and Plantation Crops Practical	L	2	1	0	50	50
10	Food Packaging (No Practical)	T	4	4	25	75	100
11	On Job Training - 5	L	2	1	0	50	50
	Total		36	30			

Note; Course type code: T: Theory, L: Lab, P: Problem solving

4. Details of course – wise Syllabus (Five units with each unit having 12 hours of class work)



SEMESTER V; 2022-2023
PAPER-I CEREAL PROCESSING

Credits 4

Teaching Hours 4

OBJECTIVES	LEARNING OUTCOMES
To Introduce the student about classification of cereals	By the end of the course, student will be known about processing methods for cereals
To impart knowledge on processing of cereals	Student will be able to identify sensory parameters for cereals
To impart knowledge on concepts of cereal processing	Student will be able to understand processing importance of cereals

Unit-1

Present status and future prospects of cereals and millets - Current trends in area, production and yield. Structure of cereals - Wheat, Corn, Rice, Barley, Oat, Rye and Sorghum. Composition and nutritive value of cereals. Physico - chemical properties of cereals, major and minor millets - Bulk density, True density, Porosity, Sphericity, Roundness, 1000 grain weight, Coefficient of friction and Angle of repose. Thermal properties - Specific heat - Thermal Conductivity - Thermal diffusivity. Theory of grain drying - Thin layer drying - Moisture content - Moisture measurement - Direct and indirect methods

Unit-2

Equilibrium moisture content (EMC) - Determination of EMC - EMC models - Hysteresis -Bound, unbound and free moisture. Drying curves - Constant rate period and falling rate period -Deep bed drying - Problems on moisture content. Methods of grain drying - Conduction, Convection, Radiation, Dielectric, Chemical and Sack drying. Grain dryers - Unheated and heated air dryers - Batch and continuous type - Flat bed type - PHTC type - Columnar type - LSU type - Baffle type - Rotary type

Unit-3

Paddy and its handling - Cleaning - Drying - Cracking of paddy during drying and its prevention Methods of paddy drying - Sun drying and mechanical drying. Rice milling. Modern rice milling process - Cleaning, Dehusking, Husk separation, Paddy separation, Polishing and Grading operations and their related equipments. Advantages and disadvantages of milling machineries -Factors that affect rice out turn during milling. By-products of rice milling - Rice bran, rice hulls, broken grains, rice pollards

Unit-4

Parboiling of paddy and its principle - Physico - chemical changes during parboiling - Steps in parboiling - soaking, steaming and drying. Effect of parboiling on milling, nutritional and cooking quality of rice. Advantages and disadvantages of parboiling. Methods of parboiling of paddy - Traditional methods- Atapa, Balam, Josh, Sela and Siddha processes. Parboiling - single boiling and double boiling methods - Improved methods - CFTRI method - Schule process - Crystal rice process. Rice conversion process - Jadavpur University method - Malek process - Rice Growers Association of California process - Avorio process



Unit-5

Pressure parboiling method. Ageing of rice - Enrichment of rice. Rice fortification - Methods of rice fortification. Processed products from rice - Rice flour - Parched rice - Puffed rice – Flaked rice – Rice starch - Instant rice - Canned rice. Wheat - Types of wheat - Wheat quality and grading. Wheat flour milling - Components of a wheat mill. Corn dry milling and wet milling - Products of corn milling. Milling of Barley, Oats and Rye. Milling of Sorghum, Bajra, Ragi - Their food uses. Malting of cereals - Uses of malt Breakfast cereal foods - Flaked breakfast cereals, puffed breakfast cereals, shredded and granular breakfast cereals and cereals puffed by extrusion



SEMESTER V; 2022-2023
PAPER -1 CEREAL PROCESSING PRACTICAL

Credits 1

Teaching Hours 2

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Execute the various methods of Cereal products processing
2. Assess the quality of Cereal products.
3. Familiarize with Cereals packaging materials
4. Process Cereal by-products and value-added products.
5. Improve the business skills in students by imparting them the skills of Cereal processing

List of Experiments

1. Study of morphological characteristics of cereals - I
2. Determination of physical properties of cereals - I
3. Determination of colour of cereals
4. Determination of moisture content of cereals
5. Experiment on parboiling of paddy
6. Cooking quality studies of rice
7. Experiments on rice shelling
8. Experiments on rice polishing
9. Processing of cereal and millet malts
10. Visit to rice bran oil extraction industry
11. Visit to a commercial cereal processing unit

Text Book

Chakravarty A. Post Harvest Technology of Cereals, Pulses and Oil seeds. Oxford and IBH Publishing Co. Ltd., Calcutta

References

Araullo E.V, Padua D.B.D and Graham. Rice- Post Harvest Technology. IDRC, Canada.

Chakraverty A. Post Harvest Technology of Cereals, Pulses and Oil seeds. Oxford and IBH Publishing Co. Ltd., Calcutta.

Chakraverty A, Majumdar A.S, Vijaya Raghavan G.S and Ramaswamy H.S. Hand Book of Post Harvest Technology. Marcel Dekker Inc., New York. Basel.

Kent N.L and Evers D. Technology of Cereals. Woodhead Publishing Co. Ltd., Cambridge, England. Scott. Flour milling process.

Shakuntala Manay N and Shadaksharaswamy M. Foods - Facts and Principles. New Age International (P) Ltd Publishers, New Delhi.

Srilakshmi B. Food Science. 2nd Edn.. New Age International (P) Ltd Publishers, New Delhi.

Subbulakshmi G and Shobha A. Udipi. Food Processing and Preservation. New Age International (P) Ltd Publishers, New Delhi.

Swaminathan M. Food Science, Chemistry and Experimental Foods. The Bangalore Printing and Publishing Co. Ltd., Bangalore.



Co-Curricular Activities:

a) Mandatory: (Training of students by teacher on Industry related skills: 15 hours)

1. **For Teacher:** Training of students by teacher in laboratory and Industries for a total of 15 hours on processing and preservation of Cereal Products and their by-products and value-added products; and the quality management and certification in Cereal processing.
2. **For Student:** Individual visit to Rice mills or related field or to a laboratory in research organization/private sector and study the various Cereal by products processing techniques.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Lab Work Report: 05.
5. Suggested Format for Lab work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
6. Unit tests (IE)

b) Suggested Co-Curricular Activities

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value-added products and processing of Cereal products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on Cereal processing and various methods of preserving Cereal products, preparation of value-added products, packaging, labelling, etc,
5. Collection of material/figures/photos related to Cereal processing, preservation and value-added products, writing and organizing them in a systematic way in a file.
6. Visits to Rice mills and Dal Mills, firms, research institutes, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.



SEMESTER V; 2022-2023
PAPER-II PROCESSING OF MEAT AND MEAT PRODUCTS

Credits 4

Teaching Hours 4

OBJECTIVES	LEARNING OUTCOMES
To Introduce the student about classification of meat and meat products	By the end of the course, student will be known about processing methods for meat
To impart knowledge on processing of meat	Student will be able to identify sensory parameters for meat
To impart knowledge on concepts of meat processing	Student will be able to understand processing importance of meat and meat products

Unit-1

Introduction: Sources and development of meat and poultry industries in India and the importance of meat and meat industries in national economy. Structure of meat muscle-microscopic view - Myofibrils - Actin - Myosin - Contraction. Chemical composition of meat muscle - muscle proteins - fats - carbohydrates - connective tissue-nutritive value of meat. Pre-slaughter care-requirements - different modes of transport of meat animal. Ante-mortem examination of meat animal; principles and judgements. Slaughtering of meat: Scientific methods of slaughter - Stunning techniques - mechanical, electrical, chemical methods; Ritual/religious methods of slaughter - Jewish, Halal, Jhatka and Spanish methods. Dressing and cutting of carcass in sheep, pig and buffalo. Post mortem examination of carcass and principles of judgement. Grading of meat and packaging of meat.

Unit-2

Postmortem changes in meat - Rigormortis - Biochemical changes associated with rigormortis which lead to the conversion of muscle to meat - Factors - Ph decline, resolution of rigor-autolytic proteolytic enzymes - microbial invasion and loss of structural integrity Meat quality parameters - Meat color - Water holding capacity - Marbling - Quantum of connective tissue - firmness and storage conditions. Palatability characters of meat and factors affecting meat quality. Methods of tenderization - aging, enzymes and curing - factors affecting tenderness. Spoilage of meat - Sources of contamination, growth of micro organisms - Deteriorative changes in meat - Identification of spoilage

Unit-3

Principles of various meat preservation techniques - Chilling - Freezing- Curing - Smoking - Thermal processing - canning - Dehydration - Irradiation and Hurdle concept. Processing technology of meat products - Basic processing - Comminution - Mechanical deboning - Emulsification - Meat emulsion - methods of stabilization of meat emulsion meat extension - preblending - Hot processing - Cooking Techniques. Cured meats - Process of curing, methods of curing - commercial processing of ham and Bacon - Sausage processing. Production of Intermediate moisture and shelf stable meat Products. Restructured meat products - tumbling - massaging - chunking - forming - tearing and Forming



Unit-4

Value added meat products like luncheon meats - meat patties - meat loaves - meat balls and meat nuggets. Safety standards in meat industry - Meat food product order - HACCP-ISO-9000 standards. Meat plant sanitation and hygiene. Structure of egg - different parts of an egg. Composition of egg - Proteins of Egg white, Yolk proteins and lipids and nutritive value of egg. Egg quality characteristics - Internal Quality - Haugh's unit- Terms indicating defective quality and Egg grading. Antemortem and post mortem examination of poultry birds - principles of judgement. Preslaughter care, handling, Transport and dressing of a poultry bird

Unit-5

Cuts of poultry bird and Indian Standards of a dressed chicken. Microbial spoilage of eggs - types of spoilage in eggs - indications - organisms causing spoilage. Preservation and maintenance of eggs - Preservation of shell eggs - Egg cleaning – Oil Treatment - Cold storage - Thermo stabilization - Immersion in liquids. Preservation of Albumin and yolk-powder production. Preservation of poultry meat - Chilling, Freezing, Curing, Smoking, Dehydration, Canning and Radiation. Processing of value-added products - Chicken barbecue, chicken sausage, meat balls and pickling

Text Books

Sharma, B.D. Modern Abattoir Practices and Animal By - Products Technology. Jaypee Brothers Medical Publishers Pvt. Ltd, New Delhi.

Books for Reference

Lawrie R.A. Meat Science, Paragoan Press, Oxford and New York.

Sharma, B.D. Modern Abattoir Practices and Animal By - Products Technology. Jaypee Brothers Medical Publishers Pvt. Ltd, New Delhi.

Sharma, B.D. Meat and Meat Products Technology (Including Poultry Products Technology), Jaypee Brothers Medical Publishers Pvt. Ltd, New Delhi.

NIIR Board of Consultants. Preservation of Meat and Poultry. Asia Pacific Business Press Inc, Delhi.

Meat Processing and Meat Products Hand Book. EIRI, Delhi.

William J. Stadel. Egg Science. CBS Publishers, New Delhi.

Co-Curricular Activities:

a) **Mandatory:** (*Training of students by teacher on Industry related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and Industries for a total of 15 hours on processing and preservation of Meat Products and their by-products and value-added products; and the quality management and certification in Meat processing.
2. **For Student:** Individual visit to Abattoirs or related Industry or to a laboratory in research organization/private sector and study the various Meat products processing techniques.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Lab Work Report: 05.
5. Suggested Format for Lab work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
6. Unit tests (IE)



b) Suggested Co-Curricular Activities

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value-added products and processing of Meat products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on Meat processing and various methods of preserving Meat products, preparation of value-added products, packaging, labelling, etc,
5. Collection of material/figures/photos related to Meat processing, preservation and value-added products, writing and organizing them in a systematic way in a file.
6. Visits to Meat Processing Industries, firms, research institutes, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.



SEMESTER V; 2022-2023

PAPER – III PROCESSING OF MEAT AND MEAT PRODUCTS PRACTICAL

Credits 1

Teaching Hours 2

SKILL OUTCOMES

On successful completion of this practical course, student shall be able to:

1. Execute the various methods of Meat and Meat products processing
2. Assess the quality of Meat products.
3. Familiarize with Meat packaging materials
4. Process Meat by-products and value-added products.
5. Improve the business skills in students by imparting them the skills of Meat and Meat Products processing

List of Experiments

1. Preslaughter operations of meat animals and poultry birds
2. Slaughtering and dressing of meat animals
3. Study of post-mortem changes
4. Meat cutting and handling
5. Evaluation of meat quality
6. Preservation of meat by different methods (dehydration-rehydration-rehydration co-efficient)
7. Preservation of meat by different methods (Freezing-thawing-drip loss)
8. Preservation of meat by different methods (Pickling)
9. Preparation of meat and poultry products
10. Preservation of meat by different methods (Poultry Meat-dehydration-rehydration)
11. Preservation of meat by different methods (poultry meat freezing, pickling)
12. Evaluation of quality and grading of eggs
13. Preservation of shell eggs
14. Identification of deterioration changes in meat & poultry products
15. Visit to slaughter houses - I
16. Visit to slaughter houses



SEMESTER V; 2022-2023

PAPER – V PROCESSING OF SPICES AND PLANTATION CROPS

Credits 4

Teaching Hours 4

OBJECTIVES	LEARNING OUTCOMES
To Introduce the student about classification of spices	By the end of the course, student will be known about spices and packaging materials
To impart knowledge on processing of spices	Student will be able to identify different types of spices
To impart knowledge on processing of plantation crops	Student will be able to understand importance of processing for spices

UNIT-1

Introduction and History of Spices and condiments, production and processing scenario of spices and plantation crops and its scope. Value addition of spices and spice products with different processing methods. Definition of major spices, Classification of spices, post harvest technology, processed products and their marketing in trade. Different technologies involved in the preparation of spice powders, spice oils, oleoresins and micro encapsulated products. Standards and specifications of spices, packaging of spices and spice products, market value of spices in India. Herbs and leafy vegetables used as spices and condiments

UNIT-2

Definition of plantation crops, Commercial value of plantation crops that are grown in India. Garlic- introduction, harvesting, post harvest technology, processing methods, Processed products and its grades Turmeric - Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades. Onion - Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades

UNIT-3

Pepper- Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades. All spice and Dil seed , Nutmeg and Mace: and Cinnamon : Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades

UNIT-4

Tea - Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, Types of tea packaging and different grades. Rubber - Introduction, harvesting, postharvest technology and treatments, processing into marketed products,

adulteration, specifications for marketed products, packaging and different grades. Cocoa - Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades



UNIT-5

Clove and Coriander, Annie seed and Fennel seeds, Chilli - Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades Cumin and Ajowan, Areca nut, Cardamom -Sweet basil and Mint - Sage and Savory - Marjoram and Saffron , Oil palm , Cashew nut , Vanilla and Annatto - Thyme and Rosemary , Coconut , Asofoetida and caraway seed, Ginger: Introduction, harvesting, post harvest technology and treatments, processing into marketed products, adulteration, specifications for marketed products, packaging and different grades, Chemistry of different spice flavors including coffee, tea, vanilla, nutmeg, mace, cinnamon, mint and Ajowan.

Text Books

Shanmugavelu K.G. Spices and Plantation Crops. Oxford & IBH Publishing Co. New Delhi

Books for Reference

Shanmugavelu K.G. Spices and Plantation Crops. Oxford & IBH Publishing Co. New Delhi

Purseglave J.W., Brown E.G., Green C.L., and Robins. Spices Vol.1 and Vol.II SRJ Academic Press. New Delhi.

Thampan P.K. Hand Book of Coconut Palm. IBA Publishing Company, New Delhi

Gupta S. Hand Book of Spices and Packaging with Formulae. Engineers India Research Institute, New Delhi.

Co-Curricular Activities:

a) **Mandatory:** (*Training of students by teacher on Industry related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and Industries for a total of 15 hours on processing and preservation of Spice Products and their by-products and value-added products; and the quality management and certification in Meat processing.
2. **For Student:** Individual visit to Abattoirs or related Industry or to a laboratory in research organization/private sector and study the various Spice products processing techniques.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Lab Work Report: 05.
5. Suggested Format for Lab work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*

6. Unit tests (IE)

b) Suggested Co-Curricular Activities

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value-added products and processing of Spice products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on Spice processing and various methods of preserving Spice products, preparation of value-added products, packaging, labelling, etc,
5. Collection of material/figures/photos related to Meat processing, preservation and value-added products, writing and organizing them in a systematic way in a file.
6. Visits to Spice Processing Industries, firms, research institutes, etc.
Invited lectures and presentations on related topics by field/industrial experts



SEMESTER V; 2022-2023
PROCESSING OF SPICES AND PLANTATION CROPS PRACTICAL

Credits 1

Teaching Hours 2

SKILL OUTCOMES

On successful completion of this practical course, student shall be able to:

1. Execute the various methods of Spice and Plantation products processing
2. Assess the quality of Spice and Plantation products.
3. Familiarize with Spice and Plantation packaging materials
4. Process Spice and Plantation by-products and value-added products.
5. Improve the business skills in students by imparting them the skills of Spice and Plantation

LIST OF EXPERIMENTS

1. Identification and characterization of flavouring compounds of spices
2. Identification and characterization of flavouring compounds of spices
3. Extraction of oil from clove, pepper, cardamom, and chilli
4. Extraction of oil from clove, pepper, cardamom, and chilli
5. Extraction of oleoresins- turmeric, ginger, pepper and clove
6. Extraction of oleoresins- turmeric, ginger, pepper and clove
7. Piperine estimation in pepper oleoresin
8. Steam distillation of spices
9. Determination of curcumin content in turmeric
10. Chemical analysis of spices- Moisture, valuable oil, specific gravity, refractive index and acid value
11. Chemical analysis of spices- Moisture, valuable oil, specific gravity, refractive index and acid value
12. Study of standard specifications of spices



SEMESTER V; 2022-2023
PAPER – IV FOOD PACKAGING

Credits 4

Teaching Hours 4

OBJECTIVES	LEARNING OUTCOMES
To Introduce the student about classification packaging materials	By the end of the course, student will be known about packaging materials
To impart knowledge on suitability of packaging materials for foods	Student will be able to identify properties of packaging materials
To impart knowledge on concepts of packaging	Student will be able to understand importance of packaging

Unit-1

Introduction to the subject, packaging situations in world and in India - Packing is pervasive and essential - Historical development of packing - 'A package must protect what it sells and sell what it protects. Need of Packaging food - Logistics - Merchandising Outlets - Handling - Transportation - Packaging machinery - Technology upgradation - Public Distribution - Cost effective packaging. Packaging requirements - Levels of Packaging - Packaging functions - Attractiveness - Protection - Convenience - Printability – Differentiability. Machinability - Environmental Impact - Low cost containment - Communication – Resealing features - Non toxicity - Aroma retention Chemistry Aseptic Packaging - Need for Aseptic Packaging - Materials used in Aseptic Packaging. Comparison of Conventional and Aseptic Packaging, Aseptic Packaging System – Advantages.

Unit-2

Hazards acting on Package during transportation - Moisture impact - Light impact – Common insect pests - Changes in food quality - Biological changes in food quality Storage - Factors influencing - Shelf Life of fruits and vegetables - Atmospheric packaging - Respiratory Metabolism Controlled Atmospheric Packaging Technology (CAP) - Modified Atmospheric Packaging Technology (MAP) - Advantages of CAP and MAP - Effect of gases on MAP foods - N₂, O₂, CO₂ Labeling Laws - Packaging laws and Regulations - SWMA Rules - PFA Rules - FPO Rule - MFPO Rules - Agmark Rules - Class 'A' commodities - Class 'B' commodities – Misbranded Labeling rules for infant foods, National Standards on Packaging code for foodstuffs and Perishables - Classification of food stuffs according to the code - Decreasing order of their perishability - Milk and milk products

Unit-3

Fruits and vegetables - Meat, fish and poultry - Bakery rich foods - Protein rich foods -Edible starch and starch products - Oils and Fats - Food grains and food grain products -Sugar and Honey Stimulant foods - Alcoholic drinks and carbonated beverages - Food Additives and



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Spices and Condiments. Packaging materials - Classification of Packages - Paper as packaging material Paper manufacture - Pulp - Mechanical pulp - Chemical pulping - Alkaline processes. Soda process - Sulfate process - Sulfite process - Semi chemical pulping - Digestion. Bleaching. Beating and Refining - Paper making - Converting - Calendering – Strength additives - Sizing agents. Types of paper - Kraft paper - Bleached paper - Grease proof paper - Glassine paper - Vegetable parchment Waxed paper

Unit-4

Paperboards. Resistance to impact - Resistance to Scratches and Abrasions - Glass manufacture - Press and Blow (P&B) - Narrow Neck Press and Blow (NNPB) - Shape of glass Container Improvements in glass manufacturing - Hot and Cold end treatment of surface – Inspection of Glass - Advantages and Disadvantages. Metal as Packaging material – Introduction. Materials used in Can Manufacture – Properties. Manufacture of Tin Plate - Pig Iron - Steel making - Tin plating - Basic types of Metal Plate - Tin free steel (TFS)

Unit-5

Manufacture of ECCS- Aluminum Cans - Manufacture of Aluminium cans - Container - Advantages and Disadvantages Making Processes - End Manufacture - Three Piece Can Manufacture - Welded Side seams Soldered Side seams - Double Seaming - Two Piece Can Manufacture DWI Cans - DRD Cans - Protective and Decorative (Lacquers/ Enamels) - Aluminium foils and Containers - Tubes - Retort Pouch - Corrosion of Metals, Plastic Consumption and use in World and in India - Plastic as packaging material Classification of Plastics, Properties of Each Plastics - Uses and Machineries used in Food Packaging. Packaging of Specific Foods Like Bread, Biscuits, Coffee, Milk Powder, Egg Powder -Carbonated Beverages - Snack Foods Mechanical and Functional Tests on Packaging, on Packaging boxes and on Packaging Materials.

Text Books

Neelam Khetarpaul and Darshan Punia, Food Packaging

Books for Reference

EIRI Board of Consultants and Engineers, New Delhi, Modern Packaging Technology

Neelam Khetarpaul and Darshan Punia, Food Packaging. Richard Coles, Food

Packaging Technology. NIIR Food Packaging Technology, Hand Book



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SEMESTER V; 2022-2023
PAPER – V ON JOB TRAINING - V

Credits 1

Teaching Hours 2

OBJECTIVES	LEARNING OUTCOMES
To Introduce about the basic metabolic rates and malnutrition concepts	By the end of the course, student will be known about energy values in foods
To impart knowledge on biochemical parameters in foods	Student will be able to assess different biochemical parameters in foods
To impart knowledge Amino acids, Lipids and Enzymes.	Student will be able to identify biochemical parameters for foods

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Prepare the project proposal and project appraisal
2. Assess the cost benefit analysis of Food production units.
3. Execute the questionnaires for market surveys and socio-economics of farmers.
4. Analyze the socio-economic conditions of Food Products and the role of cooperative societies.
5. Know the International trade of Food products and contribution of food Industries to Indian economy.

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT /INDUSTRIAL OR INSTITUTE TRAINING REPORT & SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

On Job Training provides students adequate experience in planning and managing an enterprise in totality starting from procurement of raw material to processing, production, packaging and storage of products, organizing resources and utilities, sale of products, maintain accounts and analyze profits. Finally, students will present their work along with a report of their performance. The Report should contain following. Developing a Business Plan/ Project Proposal i Identification of the product to be manufactured ii Market Survey iii Analysis of the existing status of the identified product and targeted market and customer iv Innovativeness and



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Creativity v Preparation of the project proposal with supply chain of inputs, personnel plan, production plan, finance plan, etc. and its preparation Plan for the Production i Organization of resources ii Organizing utility iii Sequential grouping of activities iv Packaging and storage v Product pricing – physical inputs, man-hours, depreciation, etc. vi Time management Production i Regularity in production ii Adhering to production plan iii Product quality assessment iv Maintenance of production records v Team work Sales i Sales strategy ii Sales volumes iii Assessment of sales performance iv Profit generated including C/B ratio, payback period, etc. Documentation and Report Presentation & Evaluation ii Personnel Management ii Preparation of final report & Oral performance



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SEMESTER V; 2022-2023

PROCESSING OF SPICES AND PLANTATION CROPS

(MODEL PAPER)

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any FIVE questions. Each question carries equal marks. (5*5 = 25)

1. Write about classification of spices
2. Write standards and specifications of any five spices.
3. Briefly explain about history of spices and condiments.
4. Explain about turmeric processing and its standards
5. Explain about post-harvest technology of pepper
6. Explain about Nutmeg and Mace processing
7. Write about processing and packaging of cocoa.
8. Write about Ginger processing.

SECTION – B

Answer All the questions. Each question carries TEN marks (5*10 = 50)

9. a) Write in detail about Tea processing Specifications and grades.

(OR)

- b) Write about Turmeric and onion processing in India

10. a) Explain about Cocoa Processing in detail.

(OR)

- b) Explain about Ginger and Cashew nut processing

11. a) Explain about chemistry of any three spice flavours

(OR)

- b) Write about Cinnamon Processing and Grading.

12. a) Write about Dil seed, Caraway and All Spice processing.

(OR)

- b) Explain about post-harvest technology of pepper and garlic.

13. a) Write about chilli processing and its adulterations in market.

(OR)

- b) Write about processing of Cashew nut and Annatto.



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PRACTICAL QUESTION PAPER

Time: 3 Hours

Maximum: 50 Marks

1. Major Experiment? 12 M
2. Minor Experiment? 8 M
3. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) 4x5= 20 M
 - a.
 - b.
 - c.
 - d.
4. Record + Viva-voce 6+4 = 10 M



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B.Voc Food Technology Syllabus(w.e.f:2020-21A.B)

SEMESTER V; 2022-2023
CEREAL PROCESSING

(MODEL PAPER)

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any FIVE questions. Each question carries equal marks. (5*5 = 25)

1. Write about Nutritive Value of corn and barley
2. Write about thermal diffusivity.
3. Write about dehusking of paddy.
4. Explain about parboiling of rice
5. Explain about puffed rice
6. Explain about corn milling
7. Write about malting of cereals
8. Write about corn wet milling

SECTION – B

Answer All the questions. Each question carries TEN marks
(5*10 = 50)

9. a) Write in detail about paddy processing and milling of rice
(OR)
b) Write about wheat milling
10. a) Explain about EMC Models

b) Explain about types of grain dryers
(OR)
11. a) Explain about traditional methods of parboiling of paddy
(OR)
b) Write about wheat quality grading and rice fortification
12. a) Write about different rice conversion process
(OR)
b) Explain about Avorio Process of rice milling.
13. a) Write about wheat flour milling
(OR)
b) Write about processing of canned rice and breakfast cereals



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SEMESTER V; 2022-2023
CEREAL PROCESSING

(MODEL PAPER)

PRACTICAL QUESTION PAPER

Time: 3 Hours

Maximum: 50 Marks

1. Major Experiment? 12M
2. Minor Experiment? 8M
3. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) 4x5= 20 M
 - a.
 - b.
 - c.
 - d.
4. Record + Viva-voce 6+4 = 10 M



SEMESTER V; 2022-2023

PROCESSING OF MEAT AND MEAT PRODUCTS

(MODEL PAPER)

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any FIVE questions. Each question carries equal marks. (5*5 = 25)

1. Write about structure of meat muscle
2. Write about pre slaughter care requirements of meat animals
3. Write about marbling and meat quality parameters.
4. Explain about parboiling of rice
5. Explain about spoilage of meat and its Identification.
6. Explain about Haughs unit and chunking
7. Write about luncheon meats
8. Write about preservation of meat

SECTION – B

Answer All the questions. Each question carries TEN marks (5*10 = 50)

9. a) Write in detail about thermos stabilization and chilling
(OR)
b) Write about processing of value added products from meat
10. a) Write about composition of egg and sausage processing.
(OR)
b) Explain about antemortem and postmortem inspection
- a) Explain about meat emulsion procedures and HACCP
(OR)
b) Write about preservation of poultry meat
11. a) Write about restructured meats.
(OR)
b) Explain about processing of IMF foods in meat.
12. a) Write about curing process for meats.
(OR)
b) Write about egg quality characteristics.



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SEMESTER V; 2022-2023

**MEAT AND MEAT PRODUCTS PROCESSING
(MODEL PAPER)**

PRACTICAL QUESTION PAPER

Time: 3 Hours

Maximum: 50 Marks

5. Major Experiment? 12 M
6. Minor Experiment? 8 M
7. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) 4x5= 20 M
 - e.
 - f.
 - g.
 - h.
8. Record + Viva-voce 6+4 = 10 M



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SEMESTER V; 2022-2023
FOOD PACKAGING

(MODEL PAPER)

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any FIVE questions. Each question carries equal marks. (5*5 = 25)

1. Write about levels of packaging
2. Write about Aseptic packaging and its advantages
3. Write about CAP
4. Explain about MAP
5. Explain about types of metal plates
6. Explain about soldering and seaming process
7. Write about functional tests of packaging materials
8. Write about packaging importance for processed foods.

SECTION – B

Answer All the questions. Each question carries TEN marks (5*10 = 50)

9. a) Write in detail about manufacture of ECCS

(OR)

- b) Write about two piece can manufacture. Write about canning advantages.

10. a) Write about NNPB and P&B

(OR)

- b) Write about TFS

11. a) Write about classification of packaging material

(OR)

- b) Write about processing of paper.

12. a) Write about PFA rules for packaging

(OR)

- b) Explain about biological changes in food quality during storage

13. a) Write about levels and functions of packaging

(OR)

- b) Write about antiseptic packaging systems and its advantages



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B.Voc Food Technology Syllabus (w.e.f:2020-21A.B)

SEMESTER V; 2022-2023
ON JOB TRAINING -V
(MODEL PAPER)

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3*5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10*1	10
VIVA VOCE	-	05
TOTAL		50