Rayat Shikshan Santha's

Annasaheb Awate College, Manchar Tal-Ambegaon, Dist- Pune.

SYLLABUS STRUCTURE (2021-22)

B.VOC (Food Processing and Quality Management)

T. Y. B.VOC (Degree) Semester- V					
Course Code	**Theory**	**Credits**	**Total Marks**	**Distribution marks**	
				Internal	**Theory**
FG- 51	Entrepreneurship Development	04	**100**	25	75
FG- 52	Food Plant Design and Layout	04	**100**	25	75
FG- 53	Snack Food Technology	04	**100**	25	75
				Practical	
FSC- 51	Industrial Microbiology	06	**150**	75	75
FSC- 52	Beverage Technology	06	**150**	75	75
FSC- 53	Industrial Training	06	**150**	75	75
	Total	**30**	**750**	**300**	**450**

T. Y. B.VOC (Degree) Semester- VI					
Course Code	**Theory**	**Credits**	**Total Marks**	**Distribution marks**	
				Internal	**Theory**
FG- 61	Business Management	04	**100**	25	75
FG- 62	Waste management and Utilization	04	**100**	25	75
FG- 63	Design and Development of New Product	04	**100**	25	75
				Practical	
FSC- 61	Food Quality control and Assurance	06	**150**	75	75
FSC- 62	Mini Project and Marketing	12	**300**	150	150
	Total	**30**	**750**	**300**	**450**

Rayat Shikshan Santha's

Annasaheb Awate College, Manchar,
Tal- Ambegaon, Dist- Pune 410503.

Department of

B. Voc. Food Processing and Quality Management

Third Year (2021-22)
Revised Syllabus

Semester V

Semester V

B. Voc. Part – III
Food Processing and Quality Management
Third Year (2021-22) Revised Syllabus

Entrepreneurship Development (FG 51)

Credits Prescribed for Theory: 03 Credits (75 Marks)

Credits Prescribed for Internal: 01 Credit (25 Marks)

Total Credits = 04

Objectives:

- To impart basic accounting knowledge as applicable to business.
- To develop right understanding regarding role and importance of monetary and financial transaction in business

Credit 1

Unit-I: Introduction **05 L**

- Entrepreneurship Concept/Meaning, Need, Competencies/qualities of an entrepreneur.

Unit-II: Entrepreneurial Support System **10 L**

- District Industry Centers (DICs), Commercial Banks, State Financial Corporations, Small Industries Service Institutes (SISIs),
- Small Industries Development, Bank of India (SIDBI), National Bank for Agriculture and Rural Development (NABARD), National Small Industries Corporation (NSIC),

Credit 2

Unit-III: Market Survey and Business Planning **10 L**

- Identification and Guidance Business Plant, Market, Assessment, Procedures for registration of small scale industry

- List of items reserved for exclusive manufacture in small scale industry, Assessment of demand and supply in potential areas of growth, Understanding business opportunity

Credit 3

Unit-IV: Project Report Preparation **10 L**

- Preliminary Project Report, Techno-Economic feasibility report, Project Viability

Unit-V: Managerial Aspects of Small Business **10 L**

- Principles of Management (Definition, functions of management viz planning, organization , coordination and control,
- Operational Aspects of Production, Inventory Management,
- Basic principles of financial management, Marketing Techniques, Personnel Management

Credit 4

Internal Assessment: 25 Marks **(1 Credit)** **15 L**

References:

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
2. Entrepreneurship Development by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi
3. Environmental Engineering and Management by Suresh K Dhamija, SK Kataria and Sons, New Delhi
4. Environmental and Pollution Awareness by Sharma BR, Satya Prakashan , New Delhi

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B. Voc. Part – III
Food Processing and Quality Management
Semester V

Food Plant Design and Layout (FG 52)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **01Credit (25 Marks)**

Total Credits = 04

Objectives:

- To acquaint the students with the plant layout operation which is required by all industries
- To check their comparative factors as equipment position raw material handling and end product delivery.

Credit 1

Unit I: Introduction **10 L**

- Plant design concepts - situations giving rise to plant design problems
- Differences in design of food processing and non-food processing plants

Unit II: Plant Considerations **10 L**

- General design considerations, Food Processing Unit Operations, Prevention of Contamination, Sanitation, Deterioration, Seasonal Production, Flow Chart for Plant Design, Identification Stage, Looking for a need, Finding a product
- Preliminary Screening of ideas, Comparative rating of product ideas: Present Market, Market Growth potential, Costs,

Credit 2

Unit III: Plant location **10 L**

- Introduction, Location Decision Process, Factors involved in the plant location decision, Subjective, Qualitative and Semi-Quantitative Techniques

Credit 3

Unit IV: Plant Utilities **08 L**

- Food Plant Utilities: Process Water, Steam, Electricity, Plant Effluents.

Unit V: Plant Requirements **7 L**

- Maintenance of Food Plant Building, Illumination and ventilation, Cleaning and sanitization, painting and color coding, Fly and insect control

Credit 4

Internal assessment (Seminars, Assignments) **15 L**

Reference Books

1. Peters, M.s and Timmerhaus, K.D, Plant Designs and Economics for Chemical Engineers, 4th Edition McGraw Hill,1991
2. Biegler L.,grossmannI.E.andWesteberg A.W., Systematic Methods of Chemical Engineering and Process Designs, prentice Hall ,1997.
3. Z. B. Maroulis and G. D. Saravacos, Food Process Design, Marcel Dekker 2003.
4. Plant Layout and Design James M.Moore Mac Millan, New York 1971

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B. Voc. Part – III
Food Processing and Quality Management
Semester V

Snack Food Technology (FG 53)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **01Credit (25 Marks)**

Total Credits = 04

General objectives:

Students will be able:

1. This course is about knowledge and gets to know about savory flavors.
2. Introduce students to methods of frying, baking, drying, heat processing, flaking, blending, coating & chipping.
3. Inform students on technical mechanism of extrusion.
4. Introduce students to various types of traditional and industrial snacks food.

Credit 1

UNIT I: Introduction **5 L**

- Introduction Importance and scope of snack food technology. Present status of snack foods industries

UNIT II: Grain based snack **10 L**

- Various types of snack food Technology for grain-based snacks: whole grains – roasted, toasted, puffed, popped and flakes, coated grains-salted, spiced and sweetened;
- flour based– batter and dough based products;
- Savoury and farsans; formulated chips and wafers, papads, instant premixes of traditional Indian snack foods.

Credit 2

UNIT III: Technology for coated nuts and fruit – vegetable based snacks 10 L

- Technology for fruit and vegetable based snacks Technology for fruit and vegetable based snacks: Chips, wafers.
- Technology for coated nuts – salted, spiced and sweetened; chikkis.

UNIT IV: Extruded snack foods 10 L

- Formulation and processing technology, coloring, flavoring and packaging, Raw materials & their role.

Credit 3

UNIT V: Equipments 10 L

- Equipments for frying, Baking and drying, toasting, roasting and flaking, popping, blending, Coating and chipping.

Credit 4

Internal assessment (Seminars, Assignments) **15 L**

Reference Books

1. Snack foods processing. Edmund WL. AVI Publ.
2. The Technology of Extrusion Cooking. Frame ND .1994. Blackie Academic.
3. Snack Food. Gordon BR. AVI Publ.
4. Snack Food Technology. Samuel AM.1976. AVI Publ.
5. Extruded foods. Matz.
6. New protein foods, vol.I,II, A.L. Altschul.
7. Extrusion of Food, Vol 2; Harper JM; 1981, CRC Press.

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B. Voc. Part – III
Food Processing and Quality Management
Semester V

Industrial Microbiology (FSC 51)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **03 Credit (75 Marks)**

Total Credits = 06

General objectives:

- To learn about industrial microbiology and its Fermentation process
- To give the students broad theoretical and practical skills in industrial microbiology.
- This **course** covers the principles of various processes associated with the production and recovery of different bio-products derived from microorganisms.

Credit 1

Unit I: Introduction **06 L**

- History of industrial microbiology, Primary and secondary metabolites produced by the microorganisms,
- Screening of microorganisms;
- Preservation of microorganisms; Organizations involved in microbiological work

Unit II: Fermentation Process **12 L**

- Fermentation media, Industrial sterilization; Fermentor: Components of a fermentor, parts of fermentors, peripheral parts and accessories, additional accessories and peripherals.
- Types of fermentors

Credit 2

Unit III: Beverages **10 L**

- Alcoholic beverages: types, production and quality; Types of fermentations processes

- Industrially important secondary metabolites; and microorganisms involved in it

Unit IV: Microbial By-products **08 L**

- Microbial cell products i.e. Mushroom, SCP, Baker's yeast, blue green algae and sprulina

Credit 3

Unit V: Fermented Food **9 L**

- Oriental and traditional fermented foods;
- Measures to improve yield of fermented products

Credit (4 to 6)

Practicals: **45 L**

1. Study of fermentor accessories
2. Study of bacterial growth curve
3. Isolation and screening of citric acid/ amylase/protease/antibiotic producing microbes, Production of citric acid/Lactic acid/ Acetic acid
4. Purification of citric acid/Lactic acid/ Acetic acid and Estimation of citric acid/Lactic acid/ Acetic acid
5. Isolation, identification of cultures producing bio-colours
6. Standardization of physical factors for higher yields of citric acid
7. Production of alcoholic beverage by fermentation
8. Production, purification and estimation of beer/ ethanol
9. Production, purification and assay of fungal amylases/proteases/Lipase
10. Production and assay of nisin from lactic acid bacteria
11. Production of polysaccharides
12. Production of traditional fermented food

Reference books

1. Modern Industrial Microbiology and Biotechnology, NdukaOkafor, Science Publishers, Enfield, New Hampshire, USA. 2004
2. Brewing Science and Practice, Dennis EB, Woodhead Publishing Ltd. Cambridge, England. 2004
3. Industrial Applications of Microbiology, Rajvaidya N. , APH Publishing, 2006
4. Industrial Microbiology, Casida LE , Wiley, 1968
5. Handbook of Indigenous Fermented Foods, Steinkraus KS, Marcel Dekker, 1996
6. Prescott & Dunn's Industrial Microbiology, G. Reed, 4th Ed. AVI Publishers, Connecticut, USA. 2004

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B. Voc. Part – III
Food Processing and Quality Management
Semester V

Beverage Technology (FSC 52)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **03 Credit (75 Marks)**

Total Credits = 06

Objectives:

- In this the students will be exposed to the knowledge of beverage types and manufacturing process involved in different beverage manufacturing industries.

Credit 1

UNIT I: Introduction **08 L**

- History, importance of beverages and status of beverage industry in India Types of beverages

UNIT II: Manufacturing Process **10 L**

- Manufacturing technology for juice-based beverages; synthetic beverages;
- carbonated, low calorie and dry beverages; isotonic and sports drinks;

Credit 2

UNIT III: Special Beverages **05 L**

- Specialty beverages based on tea, coffee, cocoa, spices, plant extracts etc.

UNIT IV: Alcoholic Beverages **11 L**

- Alcoholic beverages- types, manufacture and quality evaluation; the role of yeast in beer and other alcoholic beverages, ale type beer, lager type beer,
- Technology of brewing process, wine and related beverages, distilled spirits.

Credit 3

UNIT V: Drinking Water **11 L**

- Packaged drinking water- definition, types, manufacturing processes, quality evaluation and raw and processed water, methods of water treatment,
- BIS quality standards of bottled water; mineral water, carbonated water.

Credit 4 **15 L**

Internal Assessment (Seminar / Assignments)

Reference Books

1. Srivastava RP & Kumar S. 2003. Fruit and Vegetable Preservation - Principles and Practices.
2. International Book Distributors.
3. Hardwick WA. 1995. Handbook of Brewing. Marcel Dekker.
4. Hui YH. et al 2004. Handbook of Food and Beverage Fermentation Technology. Marcel Dekker.
5. Priest FG & Stewart GG. 2006. Handbook of Brewing. 2nd Ed. CRC.
   Richard P Vine. 1981. Commercial Wine Making – Processing and control

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B. Voc. Part – III
Food Processing and Quality Management
Semester V

Industrial Training (FSC 53)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **03 Credit (75 Marks)**

Total Credits = 06

General Objectives:

Students will be able to:

1. Develop understanding of various field activities in which students are going to play a role as food technologists after completing diploma.
2. Develop understanding of subject based knowledge given in the class room in the context of its application at work places
3. Gain firsthand experience and confidence amongst the students to enable them to use and apply knowledge and skills to solve practical problems in the field
4. Develop of special skills and abilities like interpersonal skills communication skills, attitudes and values
5. Develop perfect knowledge about the theoretical part in syllabus.
6. Know about hygiene and sanitation in industry.
7. Set the goal for personal development.
8. Solve problems with confidence.

Contents of the Report:

1. Acknowledgment
2. In-plant training certificate
3. Introduction of industry
4. Raw material and processing
5. Processing equipments
6. Industry lay- out

7. Process flow charts
8. Packaging
9. Quality control or analysis
10. Effluent treatment
11. Conclusion

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Department of

B. Voc. Food Processing and Quality Management

Third Year (2021-22)
Revised Syllabus

Semester VI

B. Voc. Part – III

Food Processing and Quality Management
Semester VI

Business Management (FG 61)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **01Credit (25 Marks)**

Total Credits = 04

Objectives:

- To impart basic Business knowledge as applicable to business.
- To develop right understanding regarding role and importance of management features in business

Credit 1

Unit 1: Introduction to Management **8 L**

- Meaning-Definition-characteristics-Significance of management- Levels of management
- Characteristics and Need of professional management.
- Principles of management by Henry Fayol.

Unit 2: Planning and Decision making **8 L**

- Planning- Meaning, importance and Process of planning- Types of planning- Advantages and limitations of planning.
- Decision making- Meaning-Definitions-Process and Techniques of decision making.

Credit 2

Unit 3: Organizing and Controlling **10 L**

- Meaning and importance of organizing- Steps on organizing- Types of Organization- Line and Staff, Functional and Committee Type

- Controlling- Meaning – Significance-Control Process-Techniques of Control

Unit 4: Co-ordination and motivation **9 L**

- Co-ordination-Meaning-Need-Techniques of Co-ordination.
- Motivation-Definition-Characteristics of Motivation-Means of Effective Motivation

Credit 3

Unit 5: Human resource management **10 L**

- Definitions, objectives of manpower planning, process, sources of recruitment,
- Process of selection
- Corporate social responsibility: Importance, business ethics.

Credit 4

Internal Assessments (Seminars /Assignments) 25 Marks (1 Credit) **15 L**

Reference Books:

1) Principles of Management- L. M. Prasad
2) Principles of Management- Dinkar Pagare
3) Principles of Management- George R. Terry
4) Principles of Management- Koonts, O'Donnell
5) Management Theory and Practice- Gupta C.B.
6) The Management Process- Davar R.S.
7) Principles of Management- Tripathy and Reddt
8) Management- Peter Drucker

B. Voc. Part – III
Food Processing and Quality Management
Semester VI

Waste management and Utilization (FG 62)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **01 Credit (25 Marks)**

Total Credits = 04

Course Objectives:

- To acquaint the students with the major source of living i.e. water, its treatment, analysis and how to make it potable. Waste management and new product development.

Credit 1

Unit I: Introduction **3 L**

- By-products obtained from cereals, pulses, legumes, oil seeds, fruit and vegetables, dairy plant, sugar and bakery, plantation crops and spices
- Egg and poultry processing industry and meat, Fermentation industry.

Unit II: Plant Hygiene and Sanitization **4 L**

- Selection of sanitizing agents for cleaning, packaging sanitation, food storage sanitation, transport sanitation and water sanitation

Credit 2

Unit III: Waste Analysis **12 L**

- Characterization of food industry wastes e.g., BOD, COD and total organic content, floatable and suspended solids in water

Unit IV: Waste Utilization **13 L**

- Concept of product development - product success and failure, factors for success, process of product
- Development, managing for product's success, Innovation strategy - possibilities for innovation, building up strategy, product development programme.

Credit 3

Unit V: Product development process **13 L**

- The product strategy, product design and process development, product Commercialization, product launch and evaluation.

Credit 4 **15 L**

Internal Assesment (Seminar/ Assignments) 25 Marks (1 Credit)

Reference Books

- **Energy Conservation through Waste Utilization**, American Society of Mechanical Engineers, New York
- **Energy Management and Conservation Handbook**. Kreit F &Goswami DY. 2008,CRC Press.
- **Energy Management**. BS Publ. Patrick DR. 1982.. Murphy WR &Mckay G. 1982.
- **Energy Management and Conservation**. Elsevier Publ.Patrick DR., Fardo SW, Richardson RE & Steven 2006.
- **Energy Conservation Guidebook**. The Fairmont Press. Wulfinghoff DR. Energy Efficiency Manual. Energy Institute Press

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Semester VI

Design And Development of New Products (FG 63)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **01Credit (25 Marks)**

Total Credits = 04

Objectives

- To know the role of government rules and regulation in food business.
- To familiar with global marketing with respect to food laws and regulations.
- To implement various government policies for the growth of food business.

Credit 1

Unit I: Introduction and Scope **07 L**

- Need, importance and objectives of formulation for new product development

Unit II: Formulation of New Product **10 L**

- Ideas, business philosophy and strategy of new product, Formulation based on sources availability
- cost competitiveness for concept developments of new products

Credit 2

Unit III: Technology for New Product **10 L**

- Adaptable technology and sustainable technology for standardized formulation for process development.

UNIT IV: Scale up, Trials and Quality Assessment **08 L**

- Process control parameters and scale-up, production trials for new product development at lab and pilot scale
- Quality assessment of new developed products

Credit 3

UNIT V: Marketing and Economics of New Product **10 L**

- Commercialization and Launching, Market testing and marketing plan
- Costing and economic evaluation of developed products

Credit 4 **15 L**

Internal Assessments (Seminars/ Assignments) (1 Credit)

Reference Books

1. New Food Product Design and Development: Beckley, Blackwell Publishing Oxford UK
2. Sensory and Consumer Research in Food Product Design and Development Moskowitz, Blackwell Publishing Oxford UK
3. Desrosier, N.W, "The Technology of Food Preservation", CBS Publishers and Distributors, New Delhi 1996.
4. Ruth H. Matthews: Pulses – Chemistry, Technology and Nutrition Marcel Dekker Inc. USA (1989)

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B. Voc. Part – III
Food Processing and Quality Management
Semester VI

Food Quality Control and Assurance (FSC 61)

Credits Prescribed for Theory: **03 Credits (75 Marks)**

Credits Prescribed for Internal: **03 Credit (75 Marks)**

Total Credits = 06

Objectives

- To learn about physical and chemical contaminants in foods.
- To develop an understanding and methodologies of instrumental techniques in food analysis used for objective methods of food quality parameters

Credit 1

UNIT I: Introduction **5 L**

- Introduction to food quality: Definition, quality concepts, quality attributes (safety, sensory, shelf life
- Convenience, extrinsic attributes, its role in food industry, need of quality control, factors affecting quality control

UNIT II: Quality Attributes **8 L**

- Concept of quality attributes- physical, chemical, nutritional, microbial, and sensory; their measurement and evaluation
- Introduction to quality attributes: Appearance, flavor, textural factors and additional quality factors.

Credit 2

UNIT III: Sensory Analysis **10 L**

- Introduction to sensory analysis; general testing conditions, Requirements of sensory
- Laboratory and organizing sensory evaluation programme. Factors influencing sensory measurements; Sensory quality parameters -Size and shape, texture, aroma, taste, color and Ranking tests; Methods of sensory evaluation of different food products.

UNIT IV: Quality Management **12 L**

- Quality assurance and management - Total quality management; Good Manufacturing Practices, Good Agricultural Practices,
- Good Laboratory Practices, good hygienic practices (PRP) Quality Management systems

Credit 3

UNIT V: Certification and composition **10 L**

- ISO System. HACCP, Principles, Implementation. Accreditation and Certification: Introduction, Benefits, accreditation organizations, Certification
- Types of certifications, Certification Bodies in India, BIS, AGMARK. Recording and documentation.

Credit (4 to 6)

Practicals **45 L**

1. Activities of Quality Department
2. Studies on bar codes
3. Writing Standard Operating Procedures
4. Preparation of quality policy & documentation (quality Manuals)
5. Application of HACCP to products
6. HACCP Plan for Fruits and Vegetables
7. Implementation procedure of ISO 22000
8. Preparation of documentation and records

9. Auditing- surveillance, mock audit
10. Visit to units with GMP, ISO, HACCP certified plants

Reference Books

- Rekha S. Singhal & P.R. Kulkarni & Dinanath V. Rage **Handbook of Indices of Food** Wood head Publishing Ltd., Cambridge.
- Owen, Fred Maidment, Derek eds. **Quality Assurance** Institution of Chemical Engineering
- S. N. Mahindru **Food Safety – A Techno- legal Analysis** Tata McGraw Hill Publishing Co. Ltd., New Delhi
- Karla Longree, Gertrude Armbruster
- **Quantity Food Sanitation** John Wiley & Sons, New York

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B. Voc. Part – III
Food Processing and Quality Management
Semester VI

Mini Project and Marketing (FSC 62)

Credits Prescribed for External: 06 Credits (150 Marks)

Credits Prescribed for Internal: 06 Credit (150 Marks)

Total Credits = 12 180 Hrs

Objectives

- To design and develop new product.
- To develop marketing ability.
- To develop the ability to undertake problem identification, formulation and solution.
- To apply their knowledge of basic science and engineering fundamentals in their project work
- Develop understanding of various field activities in which students are going to play a role as food technologists after completing diploma.
- Develop understanding of subject based knowledge given in the class room in the context of its application at work places
- Gain firsthand experience and confidence amongst the students to enable them to use and apply knowledge and skills to solve practical problems in the field
- Develop of special skills and abilities like interpersonal skills communication skills, attitudes and values
- Develop perfect knowledge about the theoretical part in syllabus.
- Know about hygiene and sanitation in industry.
- Set the goal for personal development.
- Solve problems with confidence.

Contents of the Report:

1. Acknowledgment
2. Introduction of Product (History, Innovation)

3. Raw material and processing equipments
4. Product Development
5. Process flow charts
6. Quality control and analysis
7. Packaging
8. Marketing and selling
9. Conclusion

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