SHIVAJI UNIVERSITY, KOLHAPUR

Accredited By NAAC with 'A' Grade

Faculty of Interdisciplinary Studies
Structure, Scheme and Syllabus for
Bachelor of Vocation (B.Voc.)

Food Processing Technology

Part II-Sem. III & IV

CBSC PATTERN
Syllabus to be implemented from

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June, 2021 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR
STRUCTURE AND SYLLABUS OF B.VOC.

Bachelor of Vocation (B.Voc.) – Food Processing Technology

TITLE : B.Voc. (Food Processing Technology)
Syllabus (Semester Pattern)
Under Faculty of Interdisciplinary Studies

YEAR OF IMPLEMENTATION : Syllabus will be implemented from August, 2020

DURATION : B. Voc. Part I, II and III (ThreeYears)
B. Voc. Part I - Diploma (One Year)
B. Voc. Part II - Advanced Diploma (Second Year)
B. Voc. Part III – Degree (ThirdYear)

PATTERN OF EXAMINATIOM : Semester Pattern

- **Theory Examination** - At the end of semester as per Shivaji University Rules
- **Practical Examination** - i) In the 1st, 3rd and 5th semester of B.Voc. there will be internal assessment of practical record, related report submission and project reports at the end of semester
  ii) In the second semester of B. Voc. I, there will be internal practical examination at the end of semester
  iii) In the 4th and 6th semester of B. Voc. there will be external practical examination at the end of semester

MEDIUM OF INSTRUCTION : English/ Marathi.

STRUCTURE OF COURSE : B. Voc. Part – I, II and III.
Two Semester Per Year, Two General Papers per year / semester Three Vocational Papers per Year / Semester Three Practical papers per Year / Semester.

SCHEME OF EXAMINATION :

A) THEORY-

- The theory examination shall be at the end of the each semester.
- All the general theory papers shall carry 40marks and all vocational theory papers shall carry 50marks.
- Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above.
- Question paper will be set in the view of entire syllabus preferably covering each unit of the syllabus.
- **Nature of question paper for Theory examination** (Excluding Business Communication Paper)

  i) There will be seven questions carrying equal marks.

  ii) Students will have to solve any five questions

Que. No. 1 : Short answer type question with internal choice (Two out of Three)

Que. No. 2 to Que. No. 6: Long answer type questions.

Que. No. 7 : Short Notes with internal choice (Two out of Three)

B) PRACTICALS :

Evaluation of the performance of the students in practical shall be on the basis of semester examination. Internal assessment at the end of Semester I, II and III and V and external examination at the end of Semester IV and VI as mentioned separately in each paper

Standard of Passing:

As per the guidelines and rules for B. Voc. (Attached Separately – Annexure I)

Eligibility Criteria:

1. The Eligibility for admission is 10+2 or equivalent, in any stream (Arts/Commerce/Science) from any recognized board or University.
2. The candidates after with 10+2 year ITI course/ in any branch/trade also eligible for course.
3. The candidates graduate from any faculty or engineering degree/diploma holders are also eligible.

Structure of the Course:

B. Voc. –II (Advanced Diploma) Semester –III

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	XIX	Fundamentals of Financial Accountancy - I	Theory/ Practical	50	40	10	3	2
2	XX	Food Chemistry	Theory/ Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	XXI	Food Microbiology -II	Theory	50	50	--	3	--
4	XXII	Fruit and Vegetable Processing	Theory	50	50	--	3	--
5	XXIII	Food Quality And Sensory Evaluation	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	XXIV	Food Microbiology -II	Practical	50	--	50	--	3
7	XXV	Fruit and Vegetable Processing	Practical	50	--	50	--	3
8	XXVI	Food Quality And Sensory Evaluation	Practical	50	--	50	--	3
	D	**Field Work**						
9	XXVII	Project/ Industrial Visit / Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Environmental Studies	Theory	50	50	--	--	--

General Education Components: The subject (Department/Discipline) in which a student takes admission

Skill Development Components: The subject closely related to a student's major subject

Non-Credit compulsory Courses**:** Six courses are of general nature and are compulsory

B. Voc. –II (Advanced Diploma) Semester –IV

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	XXVIII	Fundamentals of Financial Accountancy -II	Theory/ Practical	50	40	10	3	2
2	XXIX	Post Harvest Technology	Theory/ Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	XXX	Food Analytical Techniques	Theory	50	50	--	3	--
4	XXXI	Dairy Technology	Theory	50	50	--	3	--
5	XXXII	Food Safety, Hygiene and Sanitation	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	XXXIII	Food Analytical Techniques	Practical	50	--	50	--	3
7	XXXIV	Dairy Technology	Practical	50	--	50	--	3
8	XXXV	Food Safety, Hygiene and Sanitation	Practical	50	--	50	--	3
	D	**Field Work**						
9	XXXVI	Project/ Industrial Visit / Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Environmental Studies	Theory	50	50	--	--	--

General Education Components: The subject (Department/Discipline) in which a student takes admission

Skill Development Components: The subject closely related to a student's major subject

Non-Credit compulsory Courses**:** Six courses are of general nature and are compulsory

Scheme of Teaching: B. Voc. – Part II (Advanced Diploma) Semester – III

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	XIX	Fundamentals of Financial Accountancy - I	4	2	6
2	XX	Food Chemistry	4	2	6
3	XXI	Food Microbiology - II	4	-	4
4	XXII	Fruits and Vegetables Processing	4	-	4
5	XXIII	Food Quality & Sensory Evaluation	4	-	4
6	XXIV	Laboratory Work- Food Microbiology - II	-	4	4
7	XXV	Laboratory Work- Fruits and Vegetables Processing	-	4	4
8	XXVI	Laboratory Work- Food Quality & Sensory Evaluation	-	4	4
9	XXVII	Project/ Industrial Visit	-	-	-
		Environmental Studies	-	-	-
			20	16	36

Scheme of Teaching: B. Voc. – Part II (Advanced Diploma) Semester – IV

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	XXVIII	Fundamentals of Financial Accountancy - II	4	2	6
2	XXIV	Post Harvest Technology	4	2	6
3	XXX	Food Analytical Techniques	4	-	4
4	XXXI	Dairy Technology	4	-	4
5	XXXII	Food Safety, Hygiene and Sanitation	4	-	4
6	XXXIII	Laboratory Work- Food Analytical Technique	-	4	4
7	XXXIV	Laboratory Work- Dairy Technology	-	4	4
8	XXXV	Laboratory Work- Food Safety, Hygiene and Sanitation	-	4	4
9	XXXVI	Project/ Industrial Visit.	-	-	-
		Environmental Studies	-	-	-
			20	16	36

Eligibility for Admission **:** 10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream

Eligibility for Faculty **:** M. Sc. (Food Science and Nutrition / Food Processing/Food Science and Technology/Home-Science/ Food Science and Quality Control with M.Sc. (Food Tech. /Food processing) NET/SET

M. A (English) with NET/SET for Business Communication

Eligibility for Laboratory Assistant: B. Tech (Food Tech./ Food processing)/B. Sc. (Food Science and Nutrition / Food Processing/ FoodScience and Technology/Home-Science/ Food Science andQuality Control)/ B.A. Home Science.

Staffing Pattern **:** In 1st Year of B. Voc. - 1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business Communication

Laboratory Assistant **:** For 1st Year of B. Voc. - 1 Part-time

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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –I I, Semester – III

Food Processing Technology

Paper – XIX: FUNDAMENTALS OF FINANCIAL ACCOUNTANCY - I

Distribution of Workload: **Total Marks**: 50 Marks

Theory : 04 lectures per week — Theory: 40M
Practical: 02 lectures per week per batch — Practical: 10M
Total Workload: 06 lectures per week of 60min.

Unit I : Introduction to Accounting

Meaning, Nature and Advantages of Accounting, Branches of Accounting, Accounting Concepts and Conventions, Types of Accounts, Rules of journalizing, Source Documents – Cash Voucher, Petty Cash Voucher, Cash Memo – Receipts, Debit Notes, Credit Note, Paying Slips, Withdrawals, Cheque

Unit II : Journal and Ledger

Preparation of Journal entries and Ledger accounts – Subsidiary Books - Purchase Book, Purchase Return Book, Sales Book, Sales Return Book, Cash Book, Bills Receivable Book, Bills Payable Book, Journal Proper

Unit III : **Depreciation**

Meaning, Methods – Straight Line Method – Reducing Balance Method, Change in Depreciation Method.

Unit IV: Final Accounts

Preparation of Trial Balance, Preparation of Final Accounts of Sole Traders and partnership firms

Practical: Based on the theory units: Marks: 10

Reference Books:

1) Advanced Accountancy – M.C. Shukla and T.S. Garewal.
2) Advanced Accountancy – S.C. Jain and K. L. Narang
3) Advanced Accountancy – S.M. Shukla.
4) Advanced Accountancy – S. N. Maheshwari.
5) Advanced Accountancy – R. L. Gupta

Pattern of a Question paper

FUNDAMENTALS OF FINANCIAL ACCOUNTANCY - I

Semester –III Paper-XIX

Time: 2 hours **Total Marks: 40**

Q.1 Multiple Choice Question	10
Q.2 Problems on bank final accounts (This problems should be on profit and loss accounts, balance sheet along with required schedules)	10
Q.3 Write a short note (any two out of four) (Any one diagram to be drawn)	16
Q.4 Long Questions (anyone out of three)	08

Practical Evaluation:

Oral and presentation based on units prescribed **10 Marks**

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –II, Semester – III

Food Processing Technology

Paper – XX: FOOD CHEMISTRY

Distribution of Workload:
Theory : 04 lectures per week
Practical : 02 lectures per week per batch
Total Workload: 06 lectures per week of 60min.

Total Marks: 50 Marks
Theory 40M
Practical 10M

Objectives:

- To understand the basic concept, functions, and classification of food flavour.
- To familiar with different methods of Properties of Foods.

Unit-1 Water:
The basic molecule of life, physical properties of water, properties of hydration, salvation. Sorption isotherm, Bound water, free water, water activity. Distribution of water in various foods and moisture determination, Filtration Technology for Water: RO, UF, NF etc

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Unit-2 Minerals:
Major and Minor Minerals, Metal uptake in canned foods, Toxic metals

Unit-3 Food Additives:
Definition, Functions, legals approval, major additives used in food processing, nutrient supplements, functional foods, phyto-chemicals and nutraceuticals

Unit-4 Properties of Foods:
Physical Properties, Acids, Bases, and Buffers, the Chemical Bond and Colloids

Unit 5. Food Flavour and Food Colurs
Food Flavour: Introduction, definition and basic tastes, Description of food flavours and Flavour enhancers. Effect of different factors on flavor perceptions.

Food Colour (Pigments):
Introduction and classification, Food pigments (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments, caramel)

Reference Books:

1. Fennema, Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
2. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
3. Wong, Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995
4. Potter, N.N. and Hotchkiss, J. H, Food Science, 5th Ed., Chapman & Hall,1995
5. DeMan, J.M., Principles of Food Chemistry, AVI, New York, 1980
6. deMan, John M., Principles of Food Chemistry ,3rd Ed., Springer 1999
7. Desrosier, Norman W. and Desrosier., James N., The technology of food preservation , 4th Ed., Westport, Conn. : AVI Pub. Co., 1977.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –II, Semester – III

Food Processing Technology

Paper – XX: FOOD CHEMISTRY

Laboratory work

Objectives:

- To understand the basic concept, functions, and classification of food flavour.
- To familiar with different methods of Properties of Foods.

Total Marks: 10

1) Preparation and Standardization of NaOH Solution

2) Determination of percent free fatty acids and Acid value of fat /oil

3) Browning in fruits And Vegetables

4) Effects of heat on fruits & vegetables

5) Natural acidity of milk

6) Isolation of starch

7) Isolation of casein

8) Effect of sugar on boiling point of water

9) Visit to food analysis laboratory

Scheme of Internal Practical Evaluation	**10 marks**
1) Submission of Record book	5 marks
2) Viva – Voce	5 marks

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –II, Semester – III

Food Processing Technology

Paper - XXI: FOOD MICROBIOLOGY - II

Distribution of Workload: **Total Marks**: 50 Marks

Theory : 04 lectures per week

Total Workload: 04 lectures per week

Objectives:

• To enable the students to acquire knowledge on different microbiological techniques

• To study the different mode of spoilage in foods and minimize the contamination by different microorganism and Controlling the microbiological quality of food.

Unit-1: Food in relation to disease

Food borne illness: Bacteria causing food borne diseases, food borne poisoning, infections and intoxications: nonbacterial- mycotoxins, viruses, rickettsia, food borne parasites, sea food toxicants, poisoning by chemicals. Investigations of food borne illnesses, out breaks of food borne illness, materials and equipment required, the field investigation, laboratory testing, preventive measures.

Unit-2: Methods of microbiological examination of food

Culture Media- Composition, Importance, types- simple media, complex media, synthetic media, enriched media, enrichment media, selective media, indicator media, differential media, sugar media, transport media and anaerobic media.

Cultural methods- Methods for isolation of pure culture- Streak plate, Pour plate and Spread plate and Laboratory Accreditation

Unit-3: Stains and Staining Procedures

Definition of dye & stains, classification of stains- Acidic, Basic and Neutral, principles, procedure, mechanism & application of staining procedures: simple staining, negative staining, differential staining, gram staining & acid fast staining.

Unit 4: Biochemical Properties of Bacteria

Sugar fermentation, Indole production, Methyl red test, Voges-Proskauer test, Methylene blue reduction and urease test, composite media

Reference Books:

1. MC.Williams, M and Paine, H.(1984). *Modern Food preservation*Surjeet Publications, Delhi.
2. Potter, N.N. and Hotchkiss J. H.(1996). *Food Science*.CBS publishers and distributors
3. Srilakshmi, B..(2003). *Food Science* New Age International Publishers, New Delhi
4. Srivastava, R.PO and Kumar, S..(1994). *Fruit and vegetable preservation*International Bookdistribution Company, Lucknow
5. Subalakshmi, G and Udipi, S.A.. (2001). *Food processing and preservation*New Age International Publishers, New Delhi.
6. Tomar, Gajendra Singh. (2010). *Agronomy Basics and Applied*. Satish Serial Publishing House, Azadpur, New Delhi.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –II, Semester – III

Food Processing Technology

Paper-XXII: FRUITS AND VEGETABLES PROCESSING

Distribution of Workload: **Total Marks**: 50 Marks

Theory : 04 lectures per week

Total Workload**:** 04 lectures per week

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Objectives:

• To understand the importance of processing of fruits and vegetables.

• To study different processed fruits and vegetable products.

Unit-1: Introduction and Method of Preservation

Importance of fruits and vegetable, history of food preservation. Importance of vegetable crops, improving keeping quality of fruits and vegetable, cultivation of fruits and vegetable.

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Unit-2: Canning and bottling of fruits and vegetables

Principle and process of canning, Selection of fruits and vegetables, grading, washing, peeling, cutting, blanching, cooling, filling, exhausting, sealing, processing, cooling, storage containers used, bottling of fruits and vegetables, spoilage of canned foods, General consideration in establishing a commercial fruit and vegetable canning industry, Types and causes of Spoilage of canned foods.

Unit-3: Fruit and vegetable products

Unfermented and Fermented fruit beverages, Jam, Jelly and Marmalade, Preserve, Candied and Crystallized Fruits and Vegetables, Pickles, Chutneys and Sauces/Ketchups, Nectar, cordials, Fruit Cheese and Pectin.

Unit-4 Quality Control and Waste Utilization

Quality Characteristics of Fruits and Vegetable for Processing, Quality Control in Food Processing Industry, utilization of Fruit and Vegetable waste, water for Fruit and Vegetable Processing Industries.

Reference Books:

1. Subbulakshi G ,Udapi shobha A, (2001) ,food processing and preservation ,New age international (P) limited , publisher

2. Srivastava R.P, Kumar Sanjeev (1994) ,Fruits and vegetable preservation , first edition, International book distributing co.

3. S. Rangnna (1977) ,Handbook of Analysis and quality control for fruit and vegetable products (second edition) ,Tata Mcgraw hill publishing co. limited

4. Loesecke H.W.V. (2005), Drying and dehydration of foods, Updesh purohit for agrobios (India) jodhpur.

5. S. Saraswathy , T.L.preethi , S.Balsubramanyan , J.suresh ,N. Revanthy and S. naarajan (2008) : Post harvest Management of Horticulture Crops , Dr, Updesh

6. Purohit for Agrobios (India) Jodhpur Salunkhe D.K, Kadam S.S(2005), Handbook of fruit science and technology ,Marcel dekker, Inc.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part –II, Semester – III

Food Processing Technology

Paper-XXIII FOOD QUALITY & SENSORY EVALUATION

Distribution of Workload: **Total Marks**: 50 Marks

Theory : 04 lectures per week

Total Workload**:** 04 lectures per week

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Objective:

- To study the quality attributes in food industry.
- To understand the concept for sensory analysis.

Unit-1: Food quality and its role in food industry need of quality control, factors affecting quality control, Quality attributes: dominant and hidden attributes. Color-role of colors in quality spectra, different types of colour measuring instruments

Unit-2: Viscosity: - types of fluids, different viscometers to measure viscosity.
Consistency: - methods used to measure consistency or product difference between viscosity and consistency
Size and shape: - Method to find shape and size of food and food products
Defects: Classification

Unit-3: Texture: classification, role of firmness, yielding quality, juiciness, chewiness, fibrousness, grittiness, mealiness, stickiness,, measurement of texture/ kinesthetic characteristics.- by compression, mechanical thumb, puncture tester,

Unit-4: Flavour: Definition and its role in food quality, Taste, classification, taste qualities, relative intensity, reaction time, effect of disease, temperature, and taste medium on taste, basic tastes and interaction of tastes. Odour : definition, Classification, neutral - mechanisms, Olfactory abnormalities, odor testing techniques,

Reference Books:

1. Food Science – Norman N. Potter, Joseph H. Hotchkiss CBS Publishers and distributors, New Delhi, 1997 5th edition.
2. Cereal technology – Matz.
3. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987Quality Control for Food Industry Krammer&Twigg
4. Quality Control in Food Industry S.N. Herschdogrfer
5. B. Srilakshmi, Food science, New Age Publishers,2002

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part –II, Semester – III

Food Processing Technology

Paper-XXIV FOOD MICROBIOLOGY – II

Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

•To study the different mode of spoilage in foods and minimize the contamination by different preservation technology

Practicals:

1. Introduction to the Basic Microbiology Laboratory Practices and Equipments
2. Cleaning and sterilization of glassware
3. Cultivation and sub-culturing of microbes
4. Preparation of slant, stab and plates using nutrient agar
5. Simple staining
6. Negative staining
7. Standard Plate Count Method
8. Isolation of E.coli from given sample.
9. Isolation of staphylococcus from given sample.
10. IMVIC Test
11. Visit to microbiology laboratory

Scheme of practical evaluation

Internal practical examination	**50 marks**
i)Preparation of any product	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv) Viva – Voce	10 marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part –II, Semester – III

Food Processing Technology

Paper-XXV FRUITS AND VEGETABLES PROCESSING
Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

•To understand the processing of different fruits and vegetable products.

Practicals:

1. Maturity analysis of fruits (sensory, chemical, etc)
2. Preparation of Jam
3. Preparation of Jelly
4. Preparation of Cordial
5. Preparation of RTS
6. Preparation of Squash
7. Preparation of Sauerkraut
8. Drying of fruit slices, green leafy vegetables using different drying techniques
9. Visit to Fruit & Vegetable Processing Industries

Scheme of practical evaluation

Internal practical examination	**50 marks**
i) Preparation of any product	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv)Viva – Voce	10 marks

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part –II, Semester – III

Food Processing Technology

Paper- XXVI FOOD QUALITY & SENSORY EVALUATION

Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

•To understand the concept of quality and sensory of food products.

Practical:-

1. Determination of Quality attributes of various food products
2. Determination of characters of fresh fruits and vegetables
3. Determine of Sensory analysis of different food products
4. Determination of Quality evaluation of product for colours
5. Determination of Quality evaluation of product for size, shape
6. Descriptive testing for sensory evaluation of food
7. Consumer study for food quality
8. Visit to fruit & vegetable market for quality assessment

Scheme of practical evaluation

Internal practical examination	**50 marks**
i) To analyze the sensory of given product.	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv)Viva – Voce	10 marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part –II, Semester – III

Food Processing Technology

Paper-XXVII PROJECT/ INDUSTRIAL VISIT

Total Marks: 50 Marks.

Project planning and scheduling, project report submission and the viva-voce examinations.The industrial/field training shall be evaluated through the quality of workcarried out, the report submission and presentation(s). This work should be completed within a span of year.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology
Paper – XXVIII: FUNDAMENTALS OF FINANCIAL ACCOUNTANCY -II

Distribution of Workload:
Theory : 04 lectures per week
Practical : 02 lectures per week per batch

Total Marks: 50 Marks
Theory 40M
Practical 10M

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Objectives: To impact basic accounting knowledge as applicable to finance.

Unit I Computerized Accounting System

Introduction – Concept – Components –Features - Importance and Utilization of Computerized Accounting System.

Unit II Computer Application through Accounting Package Tally

Creation of Company, Group, Ledger Accounts, Feeding of Accounting Data Receipts, Payments, Purchase, Sale, Contra, Journal, Credit Note and Debit Note Inventory Information – Groups, Items and Valuation Generation of various Accounting Reports

Unit III Accounts of Professionals

Preparation of Receipts and Payment Account – Income and Expenditure Account and Balance Sheets of Non Profit Organization.

Unit IV Single Entry System

Conversion of Single Entry System into Double Entry System.

Practical: Based on the theory units: Marks: 10

Reference Books:

1) Advanced Accountancy, M. C. Shukla and T. S. Garewal.

2) Advanced Accountancy, S.C. Jain and K. L. Narang.

3) Advanced Accountancy, S.N. Maheshwari.

4) Theory and practice of Computer Accounting, Rajan Chougule and Dhaval Chougule.

Pattern of a Question paper

FUNDAMENTALS OF FINANCIAL ACCOUNTANCY –II

Semester –IV Paper-XXVIII

Time: 2 hours **Total Marks: 40**

Q.1 Multiple Choice Question	10
Q.2 Problems on bank final accounts (This problems should be on profit and loss accounts, balance sheet along with required schedules)	10
Q.3 Write a short note (any two out of four) (any one diagram to be drawn)	16
Q.4 Long Questions (anyone out of three)	08

Practical Evaluation:

Oral and presentation based on units prescribed **10 Marks**

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology
Paper – XXIX: POST HARVEST TECHNOLOGY

Distribution of Workload:
Theory : 04 lectures per week
Practical : 02 lectures per week per batch
Total Workload: 06 lectures per week of 60min.

Total Marks: 50 Marks
Theory 40M
Practical 10M

Objectives:

- To obtain that the student has the knowledge of the post-harvest physiology and technology of foods and the necessary abilities
- To design different post-harvest treatments and strategies, understanding the scientific basis.

Unit-1:

History and role of post-harvest technology; Harvesting factors and Quality- Pre-harvesting factor, Maturity of harvest, Harvesting Methods, Post-Harvest Physiology

Unit-2:

Structure and Composition of Food Grains, Engineering Properties of agricultural Materials, Physical Properties, Mechanical Properties, thermal properties, Rheological Properties and Cleaning and Grading, Post-harvest technology of Cereal, Pulses, Oilseeds, Fruits and Vegetables, Material Handling,

Unit-3

Post-Harvest Handling of Foods of Animal Origin, Post Slaughter Handling of Meat, Post-Harvest Handling of Fish and Seafood and Post-Harvest Handling of Milk

Unit-4

Food storage systems- Direct Damage, Indirect damage, Sources of infestation, Traditional storage structures, improved storage structures, modern storage structures, storage of agricultural perishables, controlled and Modified atmosphere storage, Post-harvest treatments for quality retention of horticultural crops, methods to reduce decay.

Reference Books:

1) Preservation of Fruits & Vegetables by Srivastava & Kumar. 1996. Intl. Book Publishing Co. Lucknow.
2) Preservation of Fruits & Vegetables by Siddappa et al. 1999. ICAR, New Delhi
3) An introduction to Post Harvest Technology by RBH Wills. 2003.
4) Post Harvest Technology of Fruits & Vegetables by Verma & Joshi. 2000. Indus Publication, New Delhi
5) Hand Book of Post Harvest Technology by Chakravarty et al. 2003. Mercer-Dekker Ltd
6) Kadar, A.A. 1992. Post-harvest Technology of Horticultural Crops. 2nd Ed. University of California.
7) Salunkhe, D.K., Bolia, H.R. and Reddy, N.R. 1991. Storage, Processing and Nutritional Quality of Fruits and Vegetables. Vol. I. Fruits and Vegetables. CRC.
8) Verma, L.R. and Joshi, V.K. 2000. Post Harvest Technology of Fruits and Vegetbales. Indus Publ.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology
Paper – XXIX: POST HARVEST TECHNOLOGY

(Practical) Marks: 10

1. Determination of physiological loss in weight in fruits and vegetables under cold conditions.
2. Determination of Acidity in lime juice, grape fruit in different stages.
3. Estimations of sugars.
4. Determination of Vitamin C.
5. Micropropagation of banana.
6. Determination of total solids.

Scheme of Internal Practical Evaluation	**10 marks**
1) Submission of Record book	5 marks
2) Viva – Voce	5 marks

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology

Paper-XXX FOOD ANALYTICAL TECHNIQUES

Total Workload: 04 **Total Marks:** 50 Marks
Theory - 04 lectures/week/ Batch

Objectives:

- To learn and understand the chemistry with respect to role and functionality of constituents of the food.
- To study different techniques used in analysis of food

Unit-1: Proximate analysis of food and types of solutions:
Preparation of sample, Methods for estimation of moisture, protein, fat, fibre, ash and carbohydrate

Types of Solutions: Molar Solution, Normal solution, Colloidal solutions, Buffer solutions, Measurement of Ph

Unit-2: Colorimetry and spectrophotometry:
Principle, Beer's - Lambert's law, Construction, Working, Care of colorimeter, Standard solutions, Blank solutions

Unit-3: Atomic absorption spectroscopy and Electrophoresis:
Principle, Instrumentation, Applications, Principle, Types of electrophoresis, Moving boundary electrophoresis, Zone electrophoresis, applications

Unit-4: Flame photometer and Fluorimetry:
Principle, Construction, Working, Applications Fluorimetric determination of thiamin & Riboflavin

Chromatographic Techniques: Principle, Classification, Partition chromatography, Adsorption chromatography, Gel chromatography, Ion exchange chromatography, Affinity chromatography, Paper chromatography, Column chromatography, HPLC, Immobilization

Reference Books:
1. Morris B. Jacobs The chemical analysis of foods and food products, III Edition, CBS Publishers and distributors New Delhi.
2. S. Ranganna, Hand book of analysis and quality control for fruit and vegetable products, II Ed., Tata McGraw Hill Publishing Co. New Delhi.
3. D.T.Plummer An introduction to practical biochemistry, III Ed. Tata McGraw Hill Publishing Co. New Delhi
4. Pomeranz Y., Meloan, Clifton E. 1994. Food Analysis: Theory and practice, 3rd Edn. IS: 6273 (Part-1& Part-2). Chapman and Hall. 8
5. Hand Book of analysis and quality control for fruit and Vegetable Products". IInd edition. Tata McGraw-Hill Publishing Company Ltd. New Delhi.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology
Paper- XXXI DAIRY TECHNOLOGY

Total Workload: 04 **Total Marks:** 50 Marks
Theory - 04 lectures/week/ Batch

Objectives:
- To know the need and importance of dairy industry
- To know the compositional and technological aspects of milk.
- To study processed milk products.

Unit-1: Livestock and dairy Building:
Importance of livestock, their importance species and breeds, functional requirement, site selection, buying and collection of milk, transportation of milk, milk reception in dairies. Quality and quantity test at reception. Dairy plant sanitization Cleaning in place bottle and can washing, cleaning of tankers and silos Detergents and sanitizers used.

Unit-2: Dairy Chemistry and Microbiology
Introduction, Milk - composition, food and nutritive value, physico-chemical properties. Microbiological Properties of milk, Judging and Grading of milk,

Unit-3: Milk Processing
Milk Processing flow sheet Filtration / clarification, Storage of milk, Standardization simple problems in standardization, Homogenization, Pasteurization Types of pasteurization process, Sterilization of milk. Equipments used in each process - Cream separating centrifuges, Pasteurizers (Heat Exchangers), Homogenizers, Bottle and pouch fillers, Milk Chillers.

Unit-4: Manufacture of Dairy Products
Manufacture of Ice Cream, Cream, Paneer, Butter, Ghee, Milk powder, Khoa, Cheese and milk based sweets (Only method of preparation), Manufacture of Homogenized, Standardized, rehydrated, Toned Milk and Sweetened Condensed milk, Extraction of casein from milk properties - composition and industrial uses. Production of lactose and whey Fermented products Yoghurt, Curd, acidophilus milk, butter milk

Reference Books:

1. De Sukumar, Outlines of Dairy Technology, Oxford University Press, Oxford. 2007
2. Robinson, R.K. (2 vol. set). 1986. Modern Dairy Technology. Elsevier Applied Science, UK.
3. Warner, J.M. 1976. Principles of Dairy Processing. Wiley Eastern Ltd., New Delhi.
4. Yarpar, W.J. and Hall, C.W. 1975. Dairy Technology and Engineering. AVI,Westport.
5. Rosenmal, I. 1991. Milk and Milk Products. VCH. New York.
6. Webb and Johnson, Fundamentals of Dairy Chemistry

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester – IV
Food Processing Technology
PAPER XXXII: FOOD SAFETY, HYGIENE AND SANITATION

Total Workload: 04 **Total Marks:** 50 Marks
Theory - 04 lectures/week/ Batch

Objectives:
To understand the following:
• Food safety, hygiene and sanitation
• Industrial waste utilization
• Design and implementation of food safety management systems such as ISO series, HACCP and its prerequisites such as GMP, GHP etc.

Unit-1: Introduction to Food Safety:
Definition, Types of hazards, biological, chemical, physical hazards, Factors affecting Food Safety, Importance of Safe Foods

Unit-2: Food Safety Management Tools:
Basic concept, Prerequisites- GHPs , GMPs, SOPs etc, HACCP, ISO series, TQM - concept and need for quality, components of TQM, Kaizen. Risk Analysis, Accreditation and Auditing

Unit-3: Industrial byproducts and waste utilization:
Potential & prospects of byproduct & waste utilization from the food Industries in India Byproduct & waste with special reference to Agricultural & agro based industries, cereal & cereal product, fruits and vegetable, meat, Poultry and fish, milk & milk products

Unit-4: Hygiene and Sanitation in Food Service Establishments:
Introduction, Sources of contamination, Control methods using physical and chemical agents, Waste Disposal, Pest and Rodent Control, Personnel Hygiene, Food Safety Measures, New and Emerging Pathogens, Packaging, Product labelling and Nutritional labeling, Genetically modified foods\Transgenics, Organic foods, Recent Outbreaks

Reference Books:
1. Lawley, R., Curtis L. and Davis, J. The Food Safety Hazard Guidebook , RSC publishing, 2004
2. De Vries. Food Safety and Toxicity, CRC, New York, 1997
3. Marriott, Norman G. Principles of Food Sanitation, AVI, New York, 1985
4. Forsythe, S J. Microbiology of Safe Food, Blackwell Science, Oxford, 2000 &Sons; USA, 1987
5. Quality Control for Food Industry - Krammer & Twig

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester -IV
Food Processing Technology

Paper-XXXIII FOOD ANALYTICAL TECHNIQUES
Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

• To learn the chemistry with respect to role and functionality ofconstituents of the food.

Practicals:

1. Principle and working of analytical instrument such as colorimeter, balances, oven, muffle furnace, incubator, centrifuge
2. Estimation of Moisture from food sample
3. Estimation of Protein from food sample
4. Estimation of Fat from food sample
5. Qualitative test for carbohydrates
6. Estimation of starch by Anthrone reagent
7. Estimation of Fiber from food sample
8. Determination of acidity of honey sample
9. Visit to Food Analysis Laboratory

Scheme of practical evaluation

Internal practical examination	**50 marks**
i) Estimation of chemical analysis	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv) Viva – Voce	10 marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester -IV
Food Processing Technology
Paper-XXXIV: - DAIRY TECHNOLOGY
Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

- To study different types of dairy products.
- To study the chemical analysis of milk.

Practicals:

1. Analysis techniques for milk

a) Physical examination of milk

b) Platform tests of milk

c) Detection of adulteration of milk

2. Testing of milk for acidity
3. Preparation of Dahi
4. Preparation of Lassi
5. Preparation of Basundi.
6. Preparation of Khoa.
7. Preparation of Gulabjamun.
8. Preparation of Paneer.
9. Preparation of Rasgulla.
10. Preparation of Shrikhand.
11. Visit to Dairy Industry

Scheme of practical evaluation

Internal practical examination	**50 marks**
i) Preparation of any product	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv) Viva – Voce	10 marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester -IV
Food Processing Technology
PAPER XXXV: FOOD SAFETY, HYGIENE AND SANITATION

Laboratory work

Total Workload: 04 **Total Marks:** 50 Marks

Practical - 04 lectures/week/ Batch

Objectives:

- To understand the processing techniques of agro products.

Practicals:

1. Preparation of inspection schedule and inspection chart.
2. Study of CIP system.
3. Preparation of detergent and sanitizer solution of desire strength.
4. Test for sanitization of dairy equipment (swab method).
5. Contamination control method using physical and chemical method.
6. To study personal hygiene habit.
7. Visit to industry.

Scheme of practical evaluation

Internal practical examination	**50 marks**
i) Preparation of any product	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of visit report	10 marks
iv) Viva – Voce	10 marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – II, Semester -IV
Food Processing Technology
Paper-XVIII PROJECT/ INDUSTRIAL VISIT

Total Marks: 50 Marks.

Project planning and scheduling, project report submission and the viva-voce examinations.The industrial/field training shall be evaluated through the quality of work carried out, the report submission and presentation(s). This work should be completed within a span of year.

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