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 I- Sem. I & II

CBCS PATTERN
Syllabus to be implemented from

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June, 2020 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 the1st, 3rdand 5thsemester 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 4thand 6thsemester 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. –I (Diploma) Semester –I

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	I	Business Communication- I	Theory/ Practical	50	40	10	3	2
2	II	Fundamentals of Food Science - I	Theory/ Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	III	Principles of Food Preservation	Theory	50	50	--	3	--
4	IV	Fundamentals of Food and Nutrition	Theory	50	50	--	3	--
5	V	Agro Processing - I	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	VI	Principles of Food Preservation	Practical	50	--	50	--	3
7	VII	Fundamentals of Food and Nutrition	Practical	50	--	50	--	3
8	VIII	Agro Processing	Practical	50	--	50	--	3
	D	**Field Work**						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Democracy, Elections and Good Governance	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. –I (Diploma) Semester –II

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	X	Business Communication-II	Theory/ Practical	50	40	10	3	2
2	XI	Fundamentals of Food Science – II	Theory/ Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	XII	Food Biochemistry	Theory	50	50	--	3	--
4	XIII	Food Microbiology	Theory	50	50	--	3	--
5	XIV	Agro Processing – II	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	XV	Food Biochemistry	Practical	50	--	50	--	3
7	XVI	Food Microbiology	Practical	50	--	50	--	3
8	XVII	Agro Processing	Practical	50	--	50	--	3
	D	**Field Work**						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Democracy, Elections and GoodGovernance	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 I (Diploma) Semester – I

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	I	Business Communication- I	4	2	6
2	II	Fundamentals of Food Science – I	4	2	6
3	III	Principles of Food Preservation	4	-	4
4	IV	Fundamentals of Food and Nutrition	4	-	4
5	V	Agro Processing – I	4	-	4
6	VI	Laboratory Work- Principles of Food Preservation	-	4	4
7	VII	Laboratory Work- Fundamentals of Food and Nutrition	-	4	4
8	VIII	Laboratory Work-Agro Processing-I	-	4	4
9	IX	Project/ Industrial Visit	-	-	-
		Democracy, Elections and GoodGovernance	-	-	-
			20	16	36

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

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	X	Business Communication- II	4	2	6
2	XI	Fundamentals ofFood Science – II	4	2	6
3	XII	Food Biochemistry	4	-	4
4	XIII	Food Microbiology	4	-	4
5	XIV	Agro Processing – II	4	-	4
6	XV	Laboratory Work- Food Biochemistry	-	4	4
7	XVI	Laboratory Work- Food Microbiology	-	4	4
8	XVII	Laboratory Work- Agro Processing-II	-	4	4
9	XVIII	Project/ Industrial Visit.	-	-	-
		Democracy, Elections and GoodGovernance	-	-	-
			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/ FoodScience and QualityControl with NET

/ SET
M. Tech. (Food Tech./Food processing)

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, Semester – I

Food Processing Technology

Paper – I: Business Communication-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: Use of English in Business Environment.

BusinessVocabulary:Vocabularyforbanking,marketingandformaintaining Publicrelations.

What is a sentence? Elements of a sentence.

Types of sentence: Simple, compound, complex

Unit- II: Writing a Letter of Application and CV/Resume

Structureofaletterofapplicationforvariousposts CV/Resume and itsessentials

Unit - III: Presenting Information / Data.

Presentinginformation/datausinggraphicsliketables,pie charts,treediagrams, bar diagrams, graphs, flowcharts

Unit - IV: Interview Technique

Dos and don'ts of an interview preparing for an interviewPresenting documents Language used in an interview

Practical: Based on the theory units: Marks: 10

Reference Books:

- Sethi, Anjanee&BhavanaAdhikari. *Business Communication*. New Delhi: TataMcGrawHill
- Tickoo, Champa& Jaya Sasikumar. *Writing with a Purpose*. NewYork: OUP, 1979.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication,2008.
- Herekar, Praksh. *Business Communication.* Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication.*Pune: Mehta Publi. 2003

Pattern of a Question paper
Business Communication –I
Semester –I paper-I

Time : 2 hours	**Total Marks:40**
Q.1 Do as directed questions items on unit 1 to be asked	10 (10out of 12)
Q.2 Write a letter of application	10
OR	
Draft a CV / Resume for a particular post	10
Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. (any one diagram to be drawn)	10
Q.4 Fill in the blanks in the given interview	10

Practical Evaluation:

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

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – I
Food Processing Technology
Paper – II: Fundamentals of Food Science - I

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.
- Tofamiliar with different methods of cooking

Unit–I: Introduction to food science
Concept of food, food science, Objectives of food science, Functions of food.

Unit –II: Classification of food
According to food science basic five food groups, Selection of food

Unit–III: Methods of cooking

Traditional cooking methods, Modern cooking methods, Objectives and importance of cooking

Unit –IV: Food Preparation and storage

Basic terms used in food preparation, Pre-preparation for cooking, Storage of raw and cooked food.

Reference Books:

1. B. Shreelaksmi.*Food Science*(second edition), New Age International, New Delhi.
2. Swaminathan. *Text book of Food Science*Vol-1, BAPPCO, Banglore
3. Devendrakumar Bhatt & Priyanka Tomar.*An Introduction to FoodScience, Technology & Quality Management*. Kalyani Publishers
4. Sumati R. Mudambi. *Fundamentals of Food & Nutrition*, Wiley Eastern Ltd.,New Delhi

Fundamentals of Food Science

Laboratory work

Total Marks: 10

1. Introduction to laboratory rules.
2. Equipments used in cooking.
3. Terms used in cooking.
4. Weights and Measures of raw and cooked food.
5. Methods of cooking.
    1) Traditional methods – Preparation of any two recipes from thefollowing:
        a) Boiling b) Roasting c) Frying d) Steaming
    2) Modern methods - Preparation of any two recipes from the following:
        a) Baking b) Solar c) Microwave d) Combination

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 – I, Semester -I

Food Processing Technology

Paper - III: Principles of Food Preservation

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 preservation techniques used to enhance the shelf span of food product.

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

Unit– I: Basic Principles of Food Preservation

Definition, principles and importance of food preservation, general classification on the methods of food preservation, class I and class II preservatives, combination of preservatives,preservation by irradiation and fermentation.

Unit - II: Thermal processing methods of preservation

Principle and equipments: Canning, blanching, pasteurization, sterilization, evaporation, etc. Need and principle of concentration, methods of concentration – Thermal concentration, freeze concentration, membrane concentration, changes in food quality by concentration.
Food preservation by use of low temperature – Principle, equipments and effect on quality (Chilling, cold storage, freezing etc.)

Unit -III: Preservation by Removal of Moisture

Drying and dehydration-merits and demerits, factors affecting drying, preparation of food for drying, Freeze drying, dehydrofreezing-advantages, mechanism of freeze drying and dehydrofreezing, Concentration, principles and types of concentrated foods.

Unit -IV: Preservation by radiation, chemicals and preservatives

Definition, methods ofirradiation, direct and indirect effect, measurement of radiation dose, dosedistribution, effect on microorganisms. Deterioration of irradiated foods- physical, chemical and biological, effects on quality of foods. Preservation of foods bychemicals: antioxidants, mold inhibitors, antibodies, acidulants etc.Preservation by fermentation-Definition, advantages, disadvantages, types, equipments

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 – I, Semester -I

Food Processing Technology

Paper-IV: Fundamentals of Food and Nutrition

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 nutrient in our daily diet.

• To formulate nutritionally enriched food products as perthe requirement.

Unit- I: Basic concept of Food and Food constituents

Basic concept of Food: Nutrient, Nutrition, Classification of Food, Classification of Nutrients.

Food constituents - Definition, occurrence, properties and metabolism of Protein, Carbohydrate and Lipids.

Unit-II: Enzymes and Biochemical changes in food

Enzymes - Definition, classification, enzyme kinetics.

Browning reactions in foods:

i. Non enzymic browning: Maillard reaction, browning of ascorbic acid, caramelization of sugars.

ii. Enzymic browning: Definition, mechanism, control measures.

Biochemical changes in foods of plant and animal origin: fruits, vegetables, cereals, pulses, oilseeds, meat, poultry, seafood, dairy and their products

Unit-III: Concept of food and nutrition

Concept of food and nutrition - Elements of nutrition, Food groups and role ofnutrients.

Energy metabolism – BMR

Recommended dietary allowances, Balanced diet for different age groups (Infancy to old age).

Unit– IV: Malnutrition

Malnutrition-Causes, types, symptoms and prevention, Assessment of nutritional status of the community, National nutrition policy

Reference Books:

1. Gillespie S, McLachlan M, Shrimpton R, editors. (2003). *Combating malnutrition: time to act*. Washington DC: World Bank.

2. Mudambi S.R., Rajagopal M.V. (2006). *Fundamentals of Foods, Nutrition and Diet Therapy*. New Age International Publishers, New Delhi
3. Shubangini A Joshi, (1998): *Nutrition and Dietetics*, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi
4. Srilakshmi. B, (2005): *Dietetics*, V Edition, New Age International (P) Ltd, Publishers, Chennai.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -I

Food Processing Technology

Paper-V: Agro Processing - I

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

Theory : 04 lectures per week

Total Workload**:** 04 lectures per week

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Objective:

To enable students –

1) to operate processing equipments.

2) to produce different agro products.

Unit- I: Agro processing industry

- Introduction to Agro processing industry.
- Scope and importance of Agro processed products.

Unit - II: Machinery in Agro processing

Processing equipments – Floor mill, mini grain millpulverizers, Hammer mill, Floor separator, Dal mill, Packingand Sealing machine, Balance.

Unit - III: Cereal grain – wheat and corn

- Different grains suitable for agro processing.
- Primary processing of wheat - cleaning, grading, milling
- Standards for wheat products.
- Production of wheat products.
- Dry milling, wet milling, Pop corn and corn flakes.

Unit - IV: Rice milling

- Properties of padding for rice milling
- Process of rice milling
- Hullers for rice milling.

Reference Books:

1. Yoginder K Alagh : Scope for Agro processing in India, Ajanta Publication.
2. Agro Based and Processed Food Products, New Delhi.
3. Niir Board : Modern Technology of Agro processing and Agricultural waste, NationalInstitute of India Re 2000

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Food Processing Technology
Paper-VI Principles of Food Preservation
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. Demonstration on canning and bottling of fruits and vegetables.
2. Preservation of food by high concentration of sugar i.e. preparation of jam.
3. Preservation of food by using salt e.g. Pickle.
4. Preservation of food by using acidulants i.e. pickling by acid, vinegar or acetic acid.
5. Preservation of food by using chemicals.
6. Demonstration on drying of green leafy vegetables.
7. Demonstration of preserving foods under cold v/s freezing process.
8. Visit to any food processing industry/unit.

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 – I, Semester -I
Food Processing Technology
Paper-VII Fundamentals of Food and Nutrition
Laboratory work

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

Practical - 04 lectures/week/ Batch

Objectives:

•Student will enable to formulate nutritionally enriched food products as perthe requirementmethods.

Practicals:

1.Estimation of fructose by Rescorcinol method

2.Estimations of amino acids in foods.

3. Estimation of vitamin from food sample.

4. Determination of auto oxidative rancidity of fat and oils.

5. Calculation of BMR and body surface area.

6Calculation of energy value of food.

7. Planning and calculation of nutritive value of balanced diet for different age groups.

8. Computation of energy requirement on the basis of physical activity.

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 – I, Semester -I
Food Processing Technology
Paper-VIII Agro Processing
Laboratory work

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

Practical - 04 lectures/week/ Batch

Objectives:

•To buildthe knowledge about the importance and production technology of cut flowers.

Practical

1. Physical analysis of grains.
2. Cleaning, grading and other pre-processing activities of grains.
3. Production of whole wheat flour.
4. Estimation of gluten content.
5. Flour Analysis.
6. Starch Estimation.
7. Angle of Repose.
8. Visit to Rice Mill.

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 – I, Semester -I
Food Processing Technology
Paper-IX: 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 – I, Semester – II
Food Processing Technology
Paper – X: Business Communication-II

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: Group Discussion
Preparing for a Group DiscussionInitiating a DiscussionEliciting Opinions, views etc. Expressing Agreement /DisagreementMaking Suggestions; Accepting and Declining SuggestionsSummingup**.**

UNIT –II: Business Correspondence
WritingMemos, e-mails, complaints,inquiries,etc.
Inviting Quotations Placing Orders, Tenders, etc

UNIT –III: English for Negotiation
Business Negotiations Agenda for Negotiation Stages of Negotiation

UNIT –IV: English for Marketing
Describing/ExplainingaProduct/Service Promotion of aProduct
Dealing/ bargaining with Customers
MarketingaProduct/Service:UsingPamphlets,Hoardings,
Advertisement, Public Function/Festival

Practical: Based on the theory units: Marks: 10

Reference Books:

· Herekar, Praksh (2007). *Business Communication.*Mehta Publications, Pune.
· Herekar,Praksh (2003).*PrincipalsofBusinessCommunication.*Mehta Publications, Pune
· John, David. *Group Discussions*.Arihant Publications, New Delhi.
· Kumar,Varinder(2000).*BusinessCommunication*.KalyaniPublishers,NewDelhi.
· Pardeshi,P.C.(2008). *ManagerialCommunication.*NiraliPrakashan,Pune.
· Pradhan, N. S.(2005).*Business Communication.* Himalaya Publishing House, Mumbai.
· Rai, Urmila& S. M. Rai.(2007). *BusinessCommunication.*Himalaya Publishing House, Mumbai
· Sethi,A.&B. Adhikari.*BusinessCommunication*.TataMcGrawHill.NewDelhi.
· Sonie,SubhashC.(2008) *MasteringtheArtofEffectiveBusinessCommunication,* Student Aid Publication,NewDelhi.
· Tickoo, Champa& Jaya Sasikumar (1979).*Writing with a Purpose*. OUP,New York.
· Whitehead,Jeoffrey&DavidH.Whitehead.(1996) *BusinessCorrespondence*.Wheeler Publishing, Allahabad.

Pattern of a Question paper
Business Communication –II
Semester –II paper-X

Time : 2 hours	**Total Marks:40**
Q.1 Do as directed questions items on unit 1 to be asked	10 (10out of 12)
Q.2 Write a letter of application	10
OR	
Draft a CV / Resume for a particular post	10
Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. (any one diagram to be drawn)	10
Q.4 Fill in the blanks in the given interview	10

Practical Evaluation:

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

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – II
Food Processing Technology
Paper – XI: Fundamentals of Food Science - II

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.

Objectives:
· To understand the basic concept of various cookery.
· To become familiar with preparation of various cookery.

UNIT –I: Cereal cookery
- Structure, composition and Importance of cereal grains
- Types of cereals used in cooking
- Cereal cookery- Gelatinization, Dextrinization and Identityof grain
- Processed cereals, millets and Ready-To- Eat cerealsused in cooking

UNIT –II: Pulse and Legume Cookery
- Definition, composition and structure of pulses
- Cooking of Legumes
- Factors Affecting cooking time of pulses and legumes
- Uses of legumes in cookery

UNIT –III: Nuts and Oil seeds Cookery
- Types and composition of Nuts and Oil seeds

- Toxic substances in Nuts and Oil seeds
- Changes during cooking and storage
- Function of Nuts and Oil seeds in cookery

UNIT –IV:Fruits and Vegetables Cookery
- Classification of Fruits and vegetables
- Colour pigments in Fruits and vegetables.
- Effect of heat, acids and alkali on Fruits and vegetables.
- Changes during cooking and storage.

Reference Books:

1. B. Shreelaksmi.*Food Science*(second edition), New Age International, New Delhi.
2. Swaminathan. *Text book of Food Science*Vol-1, BAPPCO, Banglore
3. Devendrakumar Bhatt & Priyanka Tomar.*An Introduction to FoodScience, Technology & Quality Management*. Kalyani Publishers
4. Sumati R. Mudambi. *Fundamentals of Food & Nutrition*, Wiley Eastern Ltd.,New Delhi.

Fundamentals of Food Science - II (Practical) Marks: 10

1Preparation of product by Gelatinization.
2.Preparation of product by Dextrinization.
3.Preparation of product by Germinated pulses.
4.Preparation of product by milled pulses.
5.Preparation of product by nuts and oilseeds.
6. Preparation of product by green leafy vegetable.
7. Preparation of product by roots and tuber.
8. Preparation of product by fruits.

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 – I, Semester – II
Food Processing Technology
Paper-XII Food biochemistry

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 ofconstituents of the food.

UNIT –I:Introduction to Food Biochemistry
Nature scope and development of food Biochemistry, role of food chemist. Moisturein foods.

i. Role and type of water in foods.
ii. Functional properties of water, role of water in food spoilage and food safety.
iii. Water activity and sorption isotherm.

UNIT –II:Carbohydrates and Vitamin
Classification, structure and function of carbohydrates.Functional characteristics of different carbohydrates, browning Reactions, modification of carbohydrates, Dietary fibers NDF, ADF, Cellulose, hemicellulose, pectin and carbohydratesdigestibility.
vitamin i. Definition of vitamin, type of vitamin,

ii. Water soluble (Vit B-1, B-2, B-3, C) and Fat soluble (Vit A, D, E, K)- their structure and functions

UNIT –III: Protein in Food
Role of proteins in foods.Classification and structural organization of proteins.Physicochemical properties, protein content and composition in various foods, functional properties of proteins in foods. Effects of processing on functional properties of proteins, unconventional sources of proteins.

UNIT –IV: Lipids in food
Role and use of lipids /fat, occurrence, fat group classification. Physicochemical aspects of fatty acids in natural foods, hydrolysis, reversion, polymorphism and its application. Chemical aspects of lipolysis, auto oxidation, antioxidants. Technology of fat and oil processing
a. Refining
b. Hydrogenations
c. Inter esterification

Reference Books:

- Garrett, R.H., Grisham, C.M. (1999).*Biochemistry*. 2nd edition, Saunders college publishing, India.
- David, L, Nelson and Cox,M.M. (2005). *Lehninger: Principles of Biochemistry,*4th edition, Maxmillan/Worth publishers/W.H. Freeman and Company.
- David Rawn, (2004). *Biochemistry*, Panima, Publishing Corporation, New Delhi.

- Donald Voet, Judith G,and other (2006). *Fundamentals of Biochemistry,* 2nd edition,John Wiley and Sons, INC.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – II
Food Processing Technology
Paper XIII Food Microbiology

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

Objectives:
•Students will develop knowledge and understanding of different foodmicroorganisms and different techniques used in its detection.

UNIT –I: Introduction to Food Microbiology
Introduction- definition, history of microbiology of food. Types ofmicroorganisms normally associated with food- bacteria, yeast and moulds.Spoilage of food; factorsaffecting spoilage of foods and associated microflora.Biochemical changes caused by microorganisms- putrefaction, lipolysis, etc.

UNIT –II:Factors affecting growth and survival of microorganisms
Extrinsic factors- relative humidity, gaseous atmosphere.Intrinsic factors- nutrient content, water activity, oxidation reduction potential.Sources of contamination. Contamination of food-stuff, vegetables, fruits,cereals, pulses, oilseeds, milk and meat during handling and processing.

UNIT –III:Deterioration and spoilage of various types of food products
Fruits, vegetables, cereal and cereal products, meat and meat products, fishand other sea foods. Prevention of spoilage of these foods.

UNIT –IV:Food borne infections and food poisoning
Bacterial with examples of infective and toxic types- *Clostridium*, *Salmonella*,*Shigella*, *Staphyllococci, Compilobacter, Escerichia, Bacillu etc.*Mycotoxins in food with reference to Aspergillus species. Protozae.Prevention of food borne diseases.

Reference Books:

- Adams, M.R. and Moses M.G. (1995): *Food Microbiology*. 1st edition, New Age International (P) Ltd.
- Bibek Ray (2005). *Fundamental Food Microbiology*.2nd edition,CRC Press, Boca Raton London New York Washington.
- Frazier W C., (2002): *Food Microbiology*, Mc Graw Hill Book Co., 6th edition, New Delhi.
- Jay, James, M (2000): *Modern Food Microbiology*, 2nd edition, CBS Publisher.
- Pelezar, M.I and Reid, R.D, (1993): *Microbiology*, 5th edition, McGRaw Hill Book Company,New York.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – II
Food Processing Technology
Paper XIV: Agro Processing-II

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

Objectives:
· To understand the processing techniques of agro products.
· To know the use of agro processing equipments.

UNIT –I:Pulses and Legumes processing
- Principles of pulse milling
- Different methods of Dhal milling
- Milling of specific legumes- Red gram, Chickpea

UNIT –II: Oil seeds Processing
- Properties and suitability of oil seeds for processing
-Methods of oilseed processing
-Terminologies in oil processing industry

UNIT –III: Processing of plantation crops
- Concept of plantation crops
- Principles of processing of plantation crops
- Processing of tea, coffee, cocoa and coconut

UNIT –IV: Spice processing
- Spices suitable for processing
- Principles and methods of spice processing
- Machinery used for spice processing
- Quality aspects of spices

Reference Books:

- Kader A A: *Post Harvest Technology of Horticultural Crops*. 2nd edition, University of California
- Niir Board (2000) : *Modern Technology of Agro processing and Agricultural waste*, National Institute of India
- Salunkhe D K, Chavan J K, Adsule R N and Kadam S S : *World Oilseeds Chemistry, Technology and Utilization*. VNR, New York

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -II
Food Processing Technology
Paper-XV: Food Biochemistry
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. Determination of moisture in food sample.
2. Determination of protein in food sample.
3. Determination of ash/minerals in food sample.
4. Determination of crude fat in food sample.
5. Determination of acidity & pH in food sample/beverages.
6. Determination of total, non-reducing and reducing sugars.
7. Determination of vitamin C content in food sample.
8. Determination of pigments in food sample
9. Estimation of calcium, iron and zinc in food products.

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 – I, Semester -II
Food Processing Technology
Paper-XVI: - Food Microbiology
Laboratory work

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

Practical - 04 lectures/week/ Batch

Objectives:

- To understanding of different food microorganisms and different techniques used in its detection.

Practicals:

1. Study of compound microscope.
2. Cleaning and sterilization of glassware.
3. Preparation of nutrient broth, potato dextrose and nutrient agar media.
4. Pure culture techniques(Streak plate and pour plate).
5. Gram staining and study of morphology of bacterial cell.
6. Microbial examination of table containers and packaging materials.
7. Assessment of quality of raw milk by MBRT.
8. Bacteriological analysis (*Coliform* count) of water by MPN method.
9. Estimation of *Salmonella* from food sample.
10. Estimation of *Staphylococcus* from food sample.

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 – I, Semester -II
Food Processing Technology
Paper-XVII: Agro Processing - II
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 soy milk.

2.Preparation of soy curd.

3.Preparation of Tofu.

4.Preparation of Pulse flour of different granule size.

5. Preparation of Peanut butter.

6. Preparation of Garlic paste.

7. Preparation of Coconut Chips.

8. Visit to Spice Industry/Pulse Mill.

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 – I, Semester -II
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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