SHIVAJI UNIVERSITY, KOLHAPUR

STRUCTURE AND SYLLABUS
OF
BACHELOR OF VOCATION

FOOD PROCESSING AND MANAGEMENT
(PART III)

TITLE : B. Voc. (Food Processing and Management)
Syllabus (Semester Pattern)
Under Faculty of Science

YEAR OF IMPLEMENTATION : Syllabus will be implemented from June 2016

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

PATTERN OF EXAMINATION: Semester Pattern

- **Theory Examination** – At the end of semester as per Shivaji University Rules
- **Practical Examination** –
  i) In the first, third and fifth semesters of B. Voc. I, II and III respectively, there will be internal assessment of practical record, related report submission and project report
  ii) In the second semester of B. Voc. I, there will be internal practical examination.
  iii) In the Fourth and Sixth semesters of B. Voc. II and III respectively, there will be external practical examination.

MEDIUM OF INSTRUCTION : English / Marathi

STRUCTURE OF COURSE : B. Voc. Part – I, II and III
Two Semesters per Year
Two General Papers per year / semester
Three Vocational Papers per Year / Semester
Three Practical papers per Year / Semester
One Project / Industry Visit/ Study Tour / Survey

SCHEME OF EXAMINATION

A) THEORY

- The theory examination shall be at the end of the each semester.
- All the general theory papers shall carry 40 marks and all vocational theory papers shall carry 50 marks.
- 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**

  i. There will be seven questions carrying equal marks.

  ii. Students will have to solve any five questions.

  Q. No. 1 : Short answer type question with internal choice

  (Two out of Three)

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

  Q. No. 7 : Short Notes with internal choice

(Two out of Three)

B) PRACTICAL

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 norms of other undergraduate degrees of Shivaji University, Kolhapur.

Structure of the Course:

B. Voc. – III (Degree) Semester – V

Sr. No	Paper No.	Title	Theory /Practical /Project	Marks (Total)	Distribution of Marks Theory	Practical
1	XXXVII	Research Methodology	Theory /Practical	50	40	10
2	XXXVIII	Legal Aspects of Food Industry	Theory /Practical	50	40	10
3	XXXIX	Meat, Fish and Poultry Processing	Theory	50	50	--
4	XXXX	Food Chemistry	Theory	50	50	--
5	XXXXI	Beverage Processing	Theory	50	50	--
6	XXXXII	Laboratory Work: Meat, Fish and Poultry Processing	Practical	50	--	50
7	XXXXIII	Laboratory Work: Food Chemistry	Practical	50	--	50
8	XXXXIV	Laboratory Work : Beverage Processing	Practical	50	--	50
9	XXXXV	Internship	-	50	--	50

B. Voc. – III (Degree) Semester – VI

Sr. No	Paper No.	Title	Theory /Practical /Project	Marks (Total)	Distribution of Marks Theory	Practical
1	XXXXVI	Business Management	Theory /Practical	50	40	10
2	XXXXVII	Food Hygiene and Sanitation	Theory /Practical	50	40	10
3	XXXXVIII	Snack Foods Processing	Theory	50	50	--
4	XXXXIX	Food Microbiology	Theory	50	50	--
5	XXXXX	Food Packaging	Theory	50	50	--
6	XXXXXI	Laboratory Work: Snack Foods Processing	Practical	50	--	50
7	XXXXXII	Laboratory Work: Food Microbiology	Practical	50	--	50
8	XXXXXIII	Laboratory Work : Food Packaging	Practical	50	--	50
9	XXXXXIV	Project	-	50	--	50

Scheme of Teaching: B. Voc. – III (Degree) Semester – V

Sr. No.	Paper No.	Title	Distribution of Workload		
			Theory	Practical/Batch	Total
1	XXXVII	Research Methodology	4	2	6
2	XXXVIII	Legal Aspects of Food Industry	4	2	6
3	XXXIX	Meat, Fish and Poultry Processing	4	-	4
4	XXXX	Food Chemistry	4	-	4
5	XXXXI	Beverage Processing	4	-	4
6	XXXXII	Laboratory Work: Meat, Fish and Poultry Processing	-	4	4
7	XXXXIII	Laboratory Work: Food Chemistry	-	4	4
8	XXXXIV	Laboratory Work : Beverage Processing	-	4	4
9	XXXXV	Internship	-	-	-
		Total --	**20**	**16**	**36**

Scheme of Teaching: B. Voc. – III (Degree) Semester – VI

Sr. No.	Paper No.	Title	Distribution of Workload		
			Theory	Practical/Batch	Total
1	XXXXVI	Business Management	4	2	6
2	XXXXVII	Food Hygiene and Sanitation	4	2	6
3	XXXXVIII	Snack Foods Processing	4	-	4
4	XXXXIX	Food Microbiology	4	-	4
5	XXXXX	Food Packaging	4	-	4
6	XXXXXI	Laboratory Work: Snack Foods Processing	-	4	4
7	XXXXXII	Laboratory Work: Food Microbiology	-	4	4
8	XXXXXIII	Laboratory Work : Food Packaging	-	4	4
9	XXXXXIV	Project	-	-	-
		Total --	**20**	**16**	**36**

Eligibility for Admission For B.Voc -I :

10 + 2 from any faculty or equivalent Diploma / Advanced Diploma in any related stream.

Eligibility for Faculty :

1) M. Tech. (Food Technology/Food processing)/M. Sc. (Food Science and Nutrition / Food Processing/Food Technology/Home-Science/ Food Science and Quality Control with NET / SET
2) M. A (English) with NET/SET for Business Communication
3) M. Com / MBA with NET/SET for Financial Accounting and Business Management

Eligibility for Laboratory Assistant:

B. Tech (Food Tech./ Food processing) ***/*** B. Sc. (Food Science and Nutrition / Food Processing/ Food Technology/Home-Science/ Food Science and Quality Control) ***/*** B.A. Home Science.

Staffing Pattern:

Teaching:

a) In 1st Year of B. Voc. - 1 Full Time and 1 Part Time Lecturer for food processing and 1 CHB Lecturer for Business Communication.
b) In 2nd Year of B. Voc. – Total requirement of faculty (Inclusive of 1st Year) will be 3 Full time for food processing, 1 CHB Lecturer for Financial Accounting and 1 CHB Lecturer for Business Communication.
c) In 3rd Year of B. Voc. – Total requirement of faculty (Inclusive of 1st & 2nd Year) will be 4 Full time and 1 part time for food processing, 1 CHB Lecturer for Business Management, 1 CHB Lecturer for Business Communication and 1 CHB Lecturer for Financial Accounting.

Lab Assistant: For 1st Year of B. Voc. - 1 Part time
For 2nd and 3rd Year (Inclusive of 1st Year) of B. Voc. – 1 Full Time

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CREDIT SYSTEM
FOR B. VOC. - FOOD PROCESSING AND MANAGEMENT

Credit system:

Education at the Institute is organized around the semester-based credit system of study. The type of credit will be credit by theory and practical examination. The prominent features of the credit system are a process of continuous evaluation of a student's performance/progress and flexibility to allow a student to progress at an optimum pace suited to his/her ability or convenience, subject to fulfilling minimum requirements for continuation. A student's performance/progress is measured by the number of credits that he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum grade point average is required to be maintained for satisfactory progress and continuation in the programme. Also a minimum number of earned credits and a minimum grade point average should be acquired in order to qualify for the degree.

All programmes are defined by the total credit requirement and a pattern of credit distribution over courses of different categories.

Course credits assignment:

Each course has a certain number of credits assigned to it depending upon its lectures and laboratory contact hours in a week. This weightage is also indicative of the academic expectation that includes in-class contact and self-study outside of class hours.

a. One credit would mean equivalent to 15 periods for lectures, practicals/workshop.
b. For internship/ field work, the credit weightage for equivalent hours shall be equal of that for lecture / practical.

The credits for each of the year of B. Voc. Course will be as follows:

Level	Awards	Normal calendar duration	Skill Component Credits	General Education Credits
Year 1	Diploma	Two Semester	36	24
Year 2	Advanced Diploma	Four Semester	36	24
Year 3	B. Voc.	Six Semester	36	24
Total			108	72

Subject wise credit assignment for B. Voc. – III (Degree) Semester – V

Sr No	Paper No.	Title	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	XXXVII	Research Methodology	Theory /Practical	50	40	10	3	2
2	XXXVIII	Legal Aspects of Food Industry	Theory /Practical	50	40	10	3	2
3	XXXIX	Meat, Fish and Poultry Processing	Theory	50	50	--	3	--
4	XXXX	Food Chemistry	Theory	50	50	--	3	--
5	XXXXI	Beverage Processing	Theory	50	50	--	3	--
6	XXXXII	Laboratory Work: Meat, Fish and Poultry Processing	Practical	50	--	50	--	3
7	XXXXIII	Laboratory Work: Food Chemistry	Practical	50	--	50	--	3
8	XXXXIV	Laboratory Work : Beverage Processing	Practical	50	--	50	--	3
9	XXXXV	Internship	--	50	--	50	--	2
			Total				**15**	**15**

For Project/Industrial visit /study tour /internship, the workload includes self-study outside of class hours i.e.4 lectures per week.

Subject wise credit assignment for B. Voc. – III (Degree) Semester – VI

Sr No	Paper No.	Title	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	XXXVI	Business Management and Entrepreneurship Development	Theory /Practical	50	40	10	3	2
2	XXXVII	Food Hygiene and Sanitation	Theory /Practical	50	40	10	3	2
3	XXXVIII	Snack Foods Processing	Theory	50	50	--	3	--
4	XXXXIX	Food Microbiology	Theory	50	50	--	3	--
5	XXXXX	Food Packaging	Theory	50	50	--	3	--
6	XXXXXI	Laboratory Work: Snack Foods Processing	Practical	50	--	50	--	3
7	XXXXXII	Laboratory Work: Food Microbiology	Practical	50	--	50	--	3
8	XXXXXIII	Laboratory Work : Food Packaging	Practical	50	--	50	--	3
9	XXXXXIV	Project	--	50	--	50	--	2
						Total	**15**	**15**

For Project/Industrial visit /study tour /internship, the workload includes self-study outside of class hours i.e.4 lectures per week.

Evaluation system:

1. Standard of passing

The maximum credits for B. Voc. Food processing and Management semester course (of six semesters) will be 30 X 6 = 180 credits. To pass in each paper students are required to obtain 4 grade points in each paper, it means 18 to 20 Marks for 50 Marks Theory / Practical papers, 14.08 to 16 for 40 Marks Theory papers and 04 marks for 10 Marks Practical papers.

2. Assessment of Project / Industrial visit /study tour /Internship Report

i) The Project/Industrial visit/study tour/Internship report must be submitted by the prescribed date usually two weeks before the end of academic session of the semester.

ii) It is desirable that the topics for Project/Industrial visit/study tour/Internship report shall be assigned by the end of previous semester.

iii) The Project/Industrial visit/study tour/Internship report and its presentation shall be evaluated by the coordinator of the course and concerned faculty**.**

3. Grade point for Theory/Practical/ Project / Industrial visit /study tour /Internship Report

- **Table –I: for 50 Marks Theory or Practical**

Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0	50	0.0 to 2.5	D	Unsatisfactory
1	50	2.6 to 5.0		
1.5	50	5.1 to 7.5		
2	50	7.6 to 10.0		
2.5	50	10.1 to 12.5		
3	50	12.6 to 15.0		

3.5	50	15.1 to 17.5		
4	50	17.6 to 20.0	C	Fair
4.5	50	20.1 to 22.5		
5	50	22.6 to 25.0	B	Satisfactory
5.5	50	25.1 to 27.5		
6	50	27.6 to 30.0	B^+	Good
6.5	50	30.1 to 32.5		
7	50	32.6 to 35.0	A	Very Good
7.5	50	35.1 to 37.5		
8	50	37.6 to 40.0	A^+	Excellent
8.5	50	40.1 to 42.5		
9	50	42.6 to 45.0	O	Outstanding
9.5	50	45.1 to 47.5		
10	50	47.6 to 50.0		

- **Table No-II: for 40 Marks Theory**

Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0.00	40	0.0 to 2.0	D	Unsatisfactory
1	40	2.08 to 4.0		
1.5	40	4.08 to 6.0		
2	40	6.08 to 8.0		
2.5	40	8.08 to 10.0		
3	40	10.08 to 12.0		
3.5	40	12.08 to 14.0		
4	40	14.08 to 16.0	C	Fair
4.5	40	16.08 to 18.0		
5	40	18.08 to 20.0	B	Satisfactory
5.5	40	20.08 to 22.0		
6	40	22.08 to 24.0	B^+	Good
6.5	40	24.08 to 26.0		
7	40	26.08 to 28.0	A	Very Good
7.5	40	28.08 to 30.0		
8	40	30.08 to 32.0	A^+	Excellent
8.5	40	32.08 to 34.0		
9	40	34.08 to 36.0	O	Outstanding
9.5	40	36.08 to 38.0		
10	40	38.08 to 40.0		

Table No- III: for 10 Marks Practical

Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0.00	10	0.0 to 0.5	D	Unsatisfactory
1	10	0.52 to 1.0		
1.5	10	1.02 to 1.5		
2	10	1.52 to 2.0		
2.5	10	2.02 to 2.5		
3	10	2.52 to 3.0		
3.5	10	3.02 to 3.5		
4	10	3.52 to 4.0	C	Fair
4.5	10	4.02 to 4.5		
5	10	4.52 to 5.0	B	Satisfactory
5.5	10	5.02 to 5.5		
6	10	5.52 to 6.0	B^+	Good
6.5	10	6.02 to 6.5		
7	10	6.52 to 7.0	A	Very Good
7.5	10	7.02 to 7.5		
8	10	7.52 to 8.0	A^+	Excellent
8.5	10	8.02 to 8.5		
9	10	8.52 to 9.0	O	Outstanding
9.5	10	9.02 to 9.5		
10	10	9.52 to 10.0		

Calculation of SGPA and CGPA-

1. Semester Grade Point Average (SGPA) = $\frac{\Sigma \text{ (course credits in passed courses X earned grade points)}}{\Sigma \text{ (Course credits in registered courses)}}$

2. Cumulative Grade Point Average (CGPA) = $\frac{\Sigma \text{ (course credits in passed courses X earned grade points) of all Semesters}}{\Sigma \text{ (Course credits in registered courses) of all Semesters}}$

3. At the end of each year of B. Voc. Program, student will be placed in any one of the divisions as detailed below:

SGPA and CGPA Table

Grade Point	Grade	Description of performance
0.00 to 3.49	D	Unsatisfactory
3.5to 4.49	C	Fair
4.5 to 5.49	B	Satisfactory
5.5 to 5.99	B^+	Good
6.0 to 6.99	A	Very Good
7.o to 8.49	A^+	Excellent
8.5 to10.00	O	Outstanding

- First Class with distinction: CGPA > 7.0 and above
- First Class: CGPA > 6.0 and < 7.0
- Second Class: CGPA > 5.0 and < 6.0
- Pass Class: CGPA > 4.0 and < 5.0
- Fail: CGPA < 4.0

SHIVAJI UNIVERSITY KOLHAPUR

Syllabus
For

BACHELOR OF VOCATION (B. Voc.)
Part - III (Degree)

Degree in Food Processing and Management

SEMESTER-V

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXVII

Research Methodology

Total marks -50
Theory - 40 marks
Practical 10 marks

Work load- 6
Theory – 4 Lectures/ week
Practical – 2 Lectures/ Week/ Batch

Objectives

To enable students-

1. To understand the meaning and importance of research.
2. To develop the ability of research and ability of scientific research.

Course content:

Unit – I - **Introduction to Research**
- Definition, objectives and importance of research.
- Nature and scope of research in food processing.
- Types of research

Unit – II - **Research design**
- Meaning and Objectives
- Characteristics of research design
- Components of research design

Unit – III - **Process of scientific research**
- Steps in research
- Methods of data collection.
- Data analysis-measures of central tendencies
- Presentation of data- classification, tabulation and graphical representation
- Scientific writing- concept, different forms of scientific writing and components of scientific writing.

Unit – IV - **Sampling Techniques**
- Meaning and nature of sampling techniques
- Characteristic of good sampling
- Types of sampling
- Steps in sample selection.

Practicals:

1) Collection of data by survey method.
2) Collection of data by case study.
3) Collection of data by experimental method.
4) Use of sampling techniques for research work.
5) Preparation of review of literature for given topic.
6) Preparation of any one scientific research writing.

References:

1) Devdas R.P. & Kulandaivel K. Hand book of Research methodology
2) S.P. Gupta Research methods
3) C.V. Good & D.E. Scafes Methods of Research
4) C.R. Kothari and Gaurav Gupta Research Methodology: Methods and Techniques New Age of publisher

Journals:

1) Asian Journal Of Diary & Food
2) Indian Food Industry – AFSTI

Scheme of Internal Practical Evaluation **10 marks**

1) Submission of practical record book. 05 Marks
2) Viva- Voce 05 Marks

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXVIII

Legal Aspects of Food Industry

Total marks -50
Theory - 40 marks
Practical 10 marks

Work load- 6
Theory – 4 Lectures/ week
Practical – 2 Lectures/Week/Batch

Objectives

To enable students-

3. To understand government rules and regulation.
4. To study adulteration in food.

Course content

Unit I **- Food laws and standards**

Importance of standards

- Types of standards
- Standards for raw material

Unit II **- International Agencies**

- Introduction, objectives and applications of ISO and CAC
- Introduction, objectives and applications of WHO and FAO
- Introduction, objectives and applications of WTO and FDA

Unit III **- Domestic/ Indian standards**

- Introduction, objectives and applications of the following,
- Food Safety and Standards Act 2006
- ECA, AGMARK
- MPEDA, BIS

Unit IV **- Food Adulteration and food safety**

- Common adulterants, methods of detection
- Safety Assurance System(SAS) – HACCP and GMP
- Nutrition Labeling and Education Act 1990

Practical

1. Quality evaluation of raw materials.
2. Analysis of canned product sample
3. Adulteration test for food product (Any Fives)
4. Testing of market sample as per FSSAI.
5. Study of nutritional labeling as per Act.
6. Visit to food industry.

References

- Krammer, A. and Twigg, B.A. 1970. “Quality Control for the Food Industry”. 3rd Edition. AVI, Westport.

- Pattee, H.E. Ed. 1985. “Evaluation of Quality of Fruits and Vegetables”. AVI, Westport.
- Ranganna, S. 1986. “Handbook of Analysis and Quality Control for Fruits and Vegetable”
- Tannenbaum, S.R. Ed. 1979. “Nutritional and Safety Aspects of Food Processing”, marcel

Scheme of Internal Practical Evaluation **10 marks**

3) Submission of practical record book. 05 Marks
4) Viva- Voce 05 Marks

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXIX

Meat, Poultry and Fish Processing

Total marks -50

Work Load - 4
Theory – 4 Lectures/ week

Objectives: To enable students-

1) To know different types of meat and meat products.
2) To understand meat, fish and egg properties.

Course Content:

Unit I. **-Meat Product Processing**

-Introduction & importance of meat products in India.

-Pre-slaughter inspection of Slaughtering animal

-Chemical composition & microscopic Structure and types of meat.

-Methods of stunning & slaughtering, post-mortem changes in animal, Quality & Grading of meat,

-Meat tenderization ,ageing, preservation of meat

Unit II. **- Poultry Product Processing**

-Introduction & importance of poultry products in India

- Pre-slaughter inspection of poultry animal for Slaughtering

-Types and classification of poultry , Bones & cuts of poultry.

- Poultry inspection.

-Preservation of poultry Products.

Unit III. **- Egg & egg Product Processing**

-Structure, composition, nutritive value & functional properties of egg.

-Processing of Egg products.

-Quality of egg & egg products.

-Effect of heat on egg proteins

Unit IV. **-Fish And Fish Product Processing**

-Classification of seafood.

-Types of Fish.

-Composition & structure of Fish.

-Post-mortem changes in fish.

-Canning, smoking, freezing & dehydration of fish.

References

2) Lawrie,R.A,Meat science

3) Lavie.a, Meat handbook

4) Portsmouth.J.I, Commercial Rabit meat production

5) Stadelmen w. J. Cotterill O. j, Egg Science & Technology

6) FSSAI schedule 4.

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXX

Food Chemistry

Work Load - 4 Total Marks – 50

Theory – 4 Lectures / Week

Objectives: To enable students-

3) To know different chemical components of foods.
4) To understand their properties.

Content:

Unit – I - **Introduction to Food Chemistry**
- Definition and importance
- Water in food- types
- Carbohydrates-
  Classification, Structure
  Physical and Chemical Properties
  Digestion and Absorption

Unit – II - **Fats and Proteins**
- Classification, Structure
- Physical and Chemical Properties
- Digestion and Absorption

Unit – III - **Vitamins and Minerals**
- Classification
- Physical and Chemical Properties
- Digestion and Absorption

Unit – IV - **Food Flavours, Colour and Toxicants**
- Types of flavours and colours
- Applications of flavours and colours
- Toxicants in food
- Browning reactions - Enzymatic browning and non enzymatic browning

References:

1. Fennema, O. R., 1976, Principles of Food Science: Part I- Food Chemistry, Marcel Dekker, New York.
2. Meyer L. H., 1973, Food Chemistry, East-West Press Pvt. Ltd., New Delhi.
3. Potter, N. N. 1978, Food Science, 3rd edition, AVI, Wesport
4. Shakuntala Manay Food Facts and principles

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No : XXXXI

Beverage Processing

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

Objectives:

To enable students

1) To know about the beverage industry
2) To understand processing and quality parameters of different beverages.

Course Content:

Unit – I	-	**Introduction to Beverage Industry**
	-	Definition, Types, importance of beverages
	-	Scope and status of beverage industry in India
	-	Water for beverages- Water treatment- Alkalinity reduction, filtration of water, water softening
	-	Quality Specification for beverage water
Unit – II	-	**Fermented beverages**
	-	Grain based
	-	Fruits based
Unit – III	-	**Carbonated Beverages**
	-	History and types of soft drinks
	-	role of various ingredients in soft drinks
	-	carbonation of soft drinks
	-	Packaging aspects in soft drink
	-	Quality control in soft drink –Chemical and sensory Quality of soft drink – Microbiological quality
Unit – IV	-	**Packaged drinking water**
	-	Definition, types,
	-	Manufacturing processes
	-	Quality evaluation of raw and processed water, BIS quality standards of bottled water; mineral water, natural spring water, flavoured water, carbonated water

References:

1. Hardwick WA. 1995. Handbook of Brewing. Marcel Dekker
2. Hui YH et al 2004, Handbook of Food and Beverage Fermentation Technology. Marcel Dekker.
3. Priest FG & Stewart GG. 2006. Handbook of Brewing. 2nd Ed. CRC.
4. Richard PV. 1981.Commercial Wine Making - Processing and Controls.AVI Publ.
5. Varnam AH & Sutherland JP. 1994. Beverages: Technology, Chemistry and Microbiology.
6. Chapman & Hall.Woodroof JG & Phillips GF.1974. Beverages: Carbonated and NonCarbonated. AVI Publ

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXXII

Laboratory Work- Meat, Poultry and Fish Processing

Total marks -50

Practical – 4 Lectures/Week/Batch

Practicals

1. To study Pre-slaughter operations of meat animals and poultry birds.
2. To study slaughtering and dressing method of meat.
3. To study preservation of meat by different methods.
4. Preparation of meat, poultry and fish products.
5. To study quality evaluation of meat, poultry and fish products.
6. To study Quality evaluation of egg.
7. Visit to meat and poultry processing industry.

Scheme of Internal Practical Examination		**50 marks**
1)	Preparation/Performance of any one practical from the above practical list	15marks
2)	Submission of practical record book	15 marks
3)	Submission of visit report	10 marks
4)	Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No. : XXXXIII

Laboratory Work (Food Chemistry)

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

Practical:

1. Identification of Unknown Carbohydrate in sample
2. Identification of Unknown Protein in sample
3. Estimation of iodine value of fat/oil
4. Estimation of Saponification number of fat/oil
5. Estimation of Acid value of fat/oil
6. Estimation of Vitamin C content of sample
7. Estimation of hardness of water

Scheme of Internal Practical Examination	**50 marks**
1) Preparation/Performance of any one product from the above practical list	15marks
2) Submission of practical record book	15 marks
3) Submission of visit report	10 marks
4) Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No : XXXXIV

LABORATORY WORK (BEVERAGE PROCESSING)

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

PRACTICALS:

1) Examination of physical impurities of water
2) Determination of brix: acid ratio of the beverage.
3) Determination of SO_2 content of soft drink.
4) Preparation of grape wine
5) Determination of saccharin
6) Determination of total CO_2 of water
7) Determination of free CO_2 of water
8) Determination of total sulphates in water
9) Determination of total alkalinity of water
10) Preparation of carbonated beverages
11) Visit to beverage processing unit

Scheme of Internal Practical Examination	**50 marks**
5) Preparation/Performance of any one product from the above practical list	15marks
6) Submission of practical record book	15 marks
7) Submission of visit report	10 marks
8) Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester-V, Paper No : XXXXV

Internship

Total Marks – 50

Internship project based on food processing in any Food Processing Industry of minimum 120 hours.

Scheme of Training Evaluation	**50 marks**
i) Submission of Project Report	30 Marks
ii) Presentation of project report	10 marks
iii) Viva – Voce	10 marks

SHIVAJI UNIVERSITY KOLHAPUR

Syllabus

For

BACHELOR OF VOCATION (B. Voc.)
Part - III (Degree)

Degree in Food Processing and Management

SEMESTER-VI

SHIVAJI UNIVERSITY, KOLHAPUR

B.Voc. Part III

Food Processing and management

Semester-VI, Paper No. : XXXXVI

Business Management

Work Load - 6	Total Marks – 50
Theory – 4 Lectures / Week	Theory - 40 Marks
Practical – 2 Lectures/Week/Batch	Practical – 10 Marks

Objectives

To enable students-

1. To enable the students to learn the basic principles and functions of management.
2. To develop skills of students in relation with application of principles and functions of management.

Course Content:

Unit – I - **Introduction to Management**

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

Unit – II - **Planning and Decision making**

- 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.

Unit – III - **Organizing and Controlling**

- 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 – IV - **Co-ordination and motivation**

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

References:

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

Practicals:

1) Study of management of food processing unit.
2) Survey regarding management in food mall.
3) Preparation of plan and organizational structure for food processing unit.
4) Study of managerial problems of entrepreneur of food processing unit.
5) Study of managerial problems of employee of food processing unit

Scheme of Internal Practical Evaluation **10 marks**

1) Submission of practical record book. 05 Marks
2) Viva- Voce 05 Marks

SHIVAJI UNIVERSITY, KOLHAPUR

B.Voc. Part III

Food Processing and management

Semester-VI, Paper No. : XXXXVII

Food Hygiene and Sanitation

Work Load - 6
Theory – 4 Lectures / Week
Practical – 2 Lectures/Week/Batch

Total Marks – 50
Theory - 40 Marks
Practical – 10 Marks

Objectives

To enable students-

3. To understand role of hygiene and sanitation in food industry.
4. To study plant layout and implementation of hygiene and sanitation.

Course Content

Unit I **- Introduction to food hygiene and sanitation**

- Importance of food hygiene and sanitation
- General principles of food hygiene
- Food handling habits and personal hygiene

Unit II **- Water**

- Sources, impurities and hardness of water
- Purification of water
- Storage of water

Unit III **- Sanitation**

- Definition
- Cleaning agents - Classification and properties
- Disinfectant, sanitizer - Classification and properties
- Advantages and disadvantages of sanitizers

Unit IV **- Plant and equipments design**

- Layout of plant sanitation
- Construction and design of plant
- Machinery design and installation
- Laws related to food hygiene and sanitation

Practicals:

1) Determination of microbial quality of water.
2) Microbial load on palm/finger.
3) Microbial quality of utensils used in preparation and eating.
4) To study methods of pest control in food industries.
5) Visit to water purification plant.
6) Visit to local food industries/ restaurant and preparation of visit report on conditions of hygiene

References

1. Hygiene in food manufacturing and handling –Barry Graham- Rack and Raymond Bmsted
2. Guide to improving food hygiene Ed. Gatson and Tiffney
3. Food Poisoning and Food Hygiene (3rd Edition) – Betty C Hobbs
4. Principles of food sanitation – Marriott Norman G.

Scheme of Internal Practical Evaluation **10 marks**

3) Submission of practical record book. 05 Marks
4) Viva- Voce 05 Marks

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Food Processing and Management

Semester-VI, Paper No. : XXXXVIII

SNACK FOODS PROCESSING

Work Load - 4 Total Marks – 50

Theory – 4 Lectures / Week

Objective:

1) To provide knowledge of principles and characteristics of snack food systems.
2) To review current practices for preparation snacks.
3) To demonstrate equipment in operation and familiarize students with practical aspects of snack foods processing.

Content:

Unit – I - **Introduction to Snack Food Industry**
- History and scope
- Domestic and Global status of Snack food Industry
- Ingredients commonly used in snack food, their attributes and functions

Unit – II - **Breakfast Cereals**
- Ready to Eat Breakfast Cereals –Flaked and Puffed Cereals, Equipments used for processing
- Extruded Snack Foods –Extrusion Process and Types of extrusion process, Single Screw and Twin Screw extruder, Hot and Cold Extrusion, Types of Extruded Snack food – First, Second and Third generation snack food

Unit – III - **Savory Foods**
- Roasted, Toasted, Popped and Coated grains and nuts(salted, spiced and sweetened)
- Savory and Farsans
- Processing of Papad, Chips and Wafers
- Snack food seasoning and application process
- Instant premixes of traditional Indian snack foods
- Indian Savoury Sweets

Unit – IV - **Post Processing of Snack Foods**
- Packaging and storage of Snack Food – Packaging Material and Packaging techniques
- Quality Evaluation of Snack Food

References:

1. Edmund W. L. Snack Foods Processing. AVI Publ.
2. Frame N. D. 1994.The Technology of Extrusion Cooking. Blackie Academic.
3. Samuel A. M.1976. Snack Food Technology. AVI Publ.
4. Booth G. R. 2003. Snack Foods. CBS Publishers, Delhi

B. Voc. Part – III

Food Processing and Management

Semester- VI, Paper No. : XXXXIX

Food Microbiology

Work Load – 4 Total Marks – 50

Theory – 4 Lectures / Week

Objectives: To enable students-

1) To study the different microorganism.
2) To understand the different food born disease and spoilage of food.

Course Content:

UNIT I **-Introduction to microbiology**

- Concept of general Microbiology

-Morphological characteristics and reproduction of bacteria, yeasts, fungi.

-Physical & Chemical factors affecting growth and destruction of micro- organisms.

Unit II **-Food Contamination**

-Introduction of sources of contamination.

-Classification of food according to ease which it spoils.

(fresh, dry and preserved)

-Bacterial & viral food intoxications.

-Naturally occurring toxicants in food, toxic metals & chemicals

Unit III **-Spoilage of Food**

-Introduction of microbial spoilage

-Cereals & cereal products spoilage

- Milk & milk products spoilage

- Fruit & Vegetable products spoilage

- Meat, poultry egg & fish products spoilage

Unit IV **-Food Born Disease**

- Introduction of food born disease

-Mode of transmission of disease

- Food borne illness

- Control of food borne illness

References

1. W.C. Frazier and D.C, 1978, 3rd edition, Food Microbiology.

2. James M. Jay 1927. 6th edition, Modern Food Microbiology

3. G.J.Banwart, Basic Food Microbiology

4. Singh B.D., Nallari P., Kavikishore P and Singh R.P Applied Microbiology

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B. Voc. Part – III

Food Processing and Management

Semester- VI, Paper No. : XXXXX

Food Packaging

Work Load – 4 Total Marks – 50

Theory – 4 Lectures / Week

Objectives: To enable students-

3) To identify the different packaging materials used for food packaging.
4) To understand the properties and applications of different packaging materials and packaging techniques.

Content:

Unit – I	-	**Introduction to Food Packaging**
	-	Definition, Functions
	-	Parts of package
	-	Characteristics of ideal packaging material
	-	Selection criteria for Package
Unit – II	-	**Food Packaging Materials**
	-	Wood and clay-Properties, Applications, Advantages and Disadvantages
	-	Glass- Properties, Applications, Advantages and Disadvantages
	-	Metal- Properties, Applications, Advantages and Disadvantages
	-	Paper- Types, Properties, Applications, Advantages and Disadvantages
	-	Plastic and laminates - Types, Properties, Applications, Advantages and Disadvantages
Unit – III	-	**Packaging of Specific Foods**
	-	Cereal, Pulses based food products
	-	Fruits and Vegetables based food products
	-	Milk based food products
	-	Animal origin food products
Unit – IV	-	**Modern Techniques of Packaging**
	-	Aseptic packaging,
	-	Active and Intelligent Packaging
	-	Edible Packaging
	-	Retortable Packaging
	-	Controlled and Modified Atmosphere Packaging

References:

1. Gorden, L. Robertson, 2006, Food Packaging: Principles and Practices, 2nd edition
2. Painy, F. A. and Painy, H. Y., 1983, Handbook of Food Packaging, Leonard Hill, Glasgow, UK.
3. Potter, N. N. 1978, Food Science, 3rd edition, AVI, Wesport
4. Shakuntala Manay Food Facts and principles

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B. Voc. Part – III

Food Processing and Management

Semester- VI, Paper No. : XXXXXI

Laboratory Work (Snack Foods Processing)

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

Practical

1. Preparation of Papad and its quality evaluation
2. Preparation of Chips and its quality evaluation
3. Preparation of Wafers and its quality evaluation
4. Preparation of Flaked cereals (Poha) and its quality evaluation
5. Preparation of Puffed cereals (Churmura) and its quality evaluation
6. Preparation of Expanded snack and its quality evaluation
7. Preparation of Roasted grains or nuts and its quality evaluation
8. Preparation of Coated grains or nuts and its quality evaluation
9. Preparation of instant food premixes and its quality evaluation
10. Visits to snack foods manufacturing industries

Scheme of External Practical Examination	**50 marks**
1) Preparation of any one product from the above practical list	15marks
2) Submission of practical record book	15 marks
3) Submission of visit report	10 marks
4) Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester VI - Paper No. : XXXXXII

Laboratory Work (Food Microbiology)

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

Practicals

1) Study of instruments used for microbiology, cleaning and sterilization of glassware.

2) Preparation of media, techniques of incubation

3) Staining methods (monochrome staining, gram staining, flagella staining,)

4) Pure culture techniques (streak plate/pour plate).

5) Isolation of microorganism from foods, microbial examination of cereal and cereal products.

6) Microbial examination of fruits and vegetables.

7) Microbial examination of milk and milk products.

8) Microbial examination of meat and meat products.

9) Microbial examination of egg and poultry.

Scheme of External Practical Examination	**50 marks**
1) Perform any one practical from the above practical list	15marks
2) Submission of practical record book	15 marks
3) Submission of visit report	10 marks
4) Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester-VI, Paper No. : XXXXXIII

Laboratory Work (Food Packaging)

Work Load - 4 Total Marks – 50

Practical – 4 Lectures/Week/Batch

Practical:

1. Identification of parts of food Package
2. Study of information on food Package
3. Determination of Thickness of paper
4. Physical test for plastics films.
5. Determination of GSM of Packaging material
6. Examination of different types of packages and containers
7. Study of edible packaging material
8. Cut out examination of can
9. Preparation of album of food packaging materials
10. Designing of sample labels.

Scheme of Internal Practical Evaluation	**50 marks**
i) Performance of any one from the above practical list	15 marks
ii) Submission of practical record book	15 marks
iii) Submission of album and sample Package	10 marks
iv) Viva – Voce	10 marks

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B. Voc. Part – III

Food Processing and Management

Semester-VI, Paper No. : XXXXXIV

Project

Total Marks – 50

Project based on the any one subject related to the syllabus

Scheme of External Evaluation	**50 marks**
i) Submission of Project Report	30 marks
ii) Presentation of project report	10 marks
iii) Viva – Voce	10 marks