

॥ सा विद्या या विमुक्तये ॥



स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

“ज्ञानतीर्थ” परिसर, विष्णुपुरी, नांदेड - ४३१६०६ (महाराष्ट्र)

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED

“Dnyanteerth”, Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)

Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with ‘A’ Grade

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संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील बी. व्होक पदवी स्तरावरील द्वितीय व तृतीय वर्षांचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०-२१ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, प्रस्तुत विद्यापीठाच्या संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील बी. व्होक पदवी स्तरावरील द्वितीय व तृतीय वर्षांचे खालील विषयांचे C.B.C.S. (Choice Based Credit System) Pattern नुसारचा अभ्यासक्रम शैक्षणिक वर्ष २०२०-२१ पासून लागू करण्याच्या दृष्टीने मा. कुलगुरू महोदयानी मा. विद्या परिषदेच्या मान्यतेच्या अधीन राहून मान्यता दिलेली आहे.

01. Food Processing, Preservation and Storage II Year (Revised)

02. Food Processing, Preservation and Storage III Year

03. Web Printing Technology III Year

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी.

‘ज्ञानतीर्थ’ परिसर,
विष्णुपुरी, नांदेड - ४३१ ६०६.
जा.क्र.:शैक्षणिक-१ / परिपत्रक/पदवी-सीबीसीएस अभ्यासक्रम/
२०२०-२१/१५१२

दिनांक : २०.११.२०२०.

प्रत माहिती व पुढील कार्यवाहीस्तव :

- १) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा प्रस्तुत विद्यापीठ.
- २) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
- ३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
- ४) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

स्वाक्षरित

सहा.कुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

Maharashtra Mahavidyalaya, Nilanga,

Dist: Latur.

Affiliated to

Swami Ramanand Teerth Marathwada University, Nanded



Revised Syllabus

Bachelor of Vocational Courses

(Food Processing, Preservation and Storage)

S.Y. (III rd and IVth semester)

Effective from June 2020

Introduction

The Bachelor in Vocational program, **Food Processing, Preservation and Storage** is divided into six semesters having 180 credits. Each semester will have courses based on General Education Components (40% of the syllabus) and Skill Development Components. (60% of the syllabus). Skill Development Components of Food Processing Technology course will emphasize on Laboratory Work / Project / Industrial Training / In-plant Internship. This program offers following General Education Components which include Communication Skill, Computer Fundamental, Environmental Science, Personality Development, Economics & Management etc. whereas Skill Development Components includes Food Chemistry, Biochemistry, Microbiology and Biotechnology, Human Nutrition, Processing and Preservation Technology of Fruits & Vegetables, Cereals, Legumes, Oil seeds, Spices and Condiments, Meat, Fish and Poultry, Milk and Milk products, Bakery and Confectionary technology, Food analysis, Food Safety Regulations and quality management, Storage of processed food and food products, special inplant training, seminar and project etc.

Aims and Objectives

During their studies, students shall learn the detailed aspects of various food processes like fruits and vegetables, milk and milk product, cereal legumes and oil seed processing, snacks and extruded processing, meat and meat product, bakery and confectionery products processing techniques being used in food industries. Also students shall get the subject knowledge of food microbiology, food processing, food preservation techniques food storage techniques, food laws and regulation, quality control and quality analysis, product development, research and development skills, entrepreneur and business management skills, computer operating skills etc. Subjects on food laws and regulation and food storage and logistics management have been included in the curriculum to impart basic knowledge of food laws, food storage systems and logistics management skills to enable the students to apply the same in his professional career.

It involves several technical skills which hold the prime importance. Each person engaged in performing food production work like food processing, quality control, microbial analysis, new product development, food enrichment, new innovation in food based products and techniques used in food industries, sales, marketing of food products etc.

Categories of personnel with Diploma/Advance Diploma/ B Voc. Degree in Food Processing, Preservation and Storage shall have the potentiality to get employment in various positions like production officer, quality officer, research and development executive, procurement officer, sales and marketing officer, production supervisor, production manager, quality manager etc., depending upon the level of qualification.

Program Structure:

The three-year B. Voc. course (full time) has a specific feature of multi point entry and multi point exit provision. After completion of one-year course, if any student desire to leave he/she will be awarded Diploma, subject to the condition of earning the required credit points. Similarly, after completing the second year he/she will be awarded Advance Diploma and once the candidate completes the third year, candidate will be awarded the Degree of Bachelor in Vocational Course (Food Processing, Preservation and Storage). If any student desire to take admission to some other university, at any other stage i.e., on completing 1st year, he/she may take admission to 2nd year in same branch. Similarly, on completing the 2nd year, one can take admission to 3rd year.

Program Outcomes

Vocational Education prepares the students for specific job roles in various sectors in food processing industry and professional organization. It trains the students for various technical and / or professional positions in food industry and also in research & development organizations for specific job roles. The program outcomes are the skills and knowledge which the students have at each exit level/at the time of graduation. These outcomes are generic and are common to all exit levels mentioned in the program structure.

- Students with vocational training can find work in several state and central government organizations, non-profit groups, and academic institutions and in private sectors as well.
- This program prepares students for specific types of occupations and frequently for direct entry into the market.
- After completion of this program students will have enough competences, to get benefit from market opportunities.

- This program would enable students to update their knowledge and professional skills for entering the work force executing income generating activities or occupying better positions
- At each exit level of this program, students will be able to
 - Apply knowledge of general education subjects and skill development subjects to the conceptualization of food processing technologies.
 - Designing and formulation of new food products, on the basis of consumers demands, development of methodology/technologies of food processing design, that meet solution needs, with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
 - Conduct and undertake investigations of problems including design of processing technology for various type of food, food analysis, food quality and safety aspects and interpretation of data in order to provide valid conclusions.
 - Create, select and apply appropriate processing technology/techniques, resources, modern processing tools in order to improve the quality, safety of the shelf life and processed food to keep it fresh.
 - Communicate effectively on minimal processing activity and value addition to the farmers/producers/grower at large, such as being able to comprehend and write effective reports, design documentation and make effective presentations.
 - Demonstrate understanding of the social, health, safety, legal and cultural issues and the consequent responsibilities relevant to food processing.
 - Understand and commit to professional ethics and responsibilities and norms/regulation for manufacturing of processed food and its effects on health.
 - Understand the impact of food processing technology solutions in a societal context and demonstrate technical know-how and understanding of food safety, quality for sustainable development.

Exit Options:

Bachelor of Vocational (B. Voc.) is launched under the scheme of University Grants Commission for skill development based on higher education leading to Bachelor of Vocational (B. Voc.) Degree with multiple exits as Diploma ,Advanced Diploma under the

National Skill Qualification Framework (NSQF). The B. Voc. programme incorporates specific job roles and their National Occupational Standards along with broad based general education.

1. B. Voc. Programme has been designed as per National Skill Qualification Framework emphasizing on skill based education.

2. Levels of Award

The certification levels shall lead to

1. Certificate after successful completion of the course at the end of first semester.
2. Diploma after successful completion of the course at the end of first year
3. Advanced Diploma after successful completion of the course at the end of second year
4. B. Voc. Degree after successful completion of the course at the end of third year in Food processing, preservation and storage.

Skills Acquired

1. Skills to be acquired after completion of 1st Year:

After successful completion of the 1st year, the student shall be able to perform the following skills.

- 1) Prepare a different product of fruits and vegetables
- 2) Knowledge about software: MS Word, MS Excel, MS Power Point, PageMaker and Typing (English & Marathi)
- 3) Prepare jam, jelly and marmalade
- 4) Prepare ketchup, candies
- 5) Prepare confectionery products
- 6) Students able to prepare cake, pastries
- 7) Students able to analysis chemical constituents of food
- 8) Students able to analysis microbial count
- 9) Students are able to prepare different media and able to prepare culture media

- **Self-Employment and Employment Opportunities:** On successful completion of the course the candidates can either get employed, or become a self-employed / Entrepreneur in any one of the following fields

1. Production
2. Quality
3. Microbial

4. Can be start own layout like candy, ketchup, pickle, jam, jelly etc.
5. Confectionery products like cake, pastries, etc.

2.Skills to be acquired after completion of 2nd Year:

After successful completion of the 2nd year, the student shall be able to perform the following skills.

- 1) Students will be able to prepare bakery products
- 2) Students will be able to prepare milk and milk products
- 3) Students will be able to prepare spices and their byproducts
- 4) Students will be able to produce different fruits and vegetable based products like jam, jelly, ketchup, candy, berrages etc.
- 5) Students will be able prepare meat and meat products
- 6) Students will be able produce fish products
- 7) Students will be able to preserve meat, fish etc.

- **Self-Employment and Employment Opportunities:** On successful completion of the course the candidates can either get employed, or become a self-employed / Entrepreneur in any one of the following fields.

- 1) Bakery industries
- 2) Dairy industries
- 3) Meat processing industries
- 4) Fruits and vegetable industries
- 5) Pickles manufacturing industries
- 6) Dal mills
- 7) Oil processing and packing industries

Student will be able to start their own bakery, sweet homes, milk collection centres, milk packing and chilling centres, milk and milk processing industries etc.

3.Skills to be acquired after completion of 3rd Year:

After successful completion of the 3rd year, the student shall be able to perform the following skills.

- 1) To get knowledge about food laws and regulation
- 2) Students will be able produce different beverages
- 3) Students get idea about business management
- 4) Students will be able start cold storage and warehouse
- 5) Students will be able to manage accounts and statics
- 6) Students will be able to manage logistics

- **Self-Employment and Employment Opportunities:** On successful completion of the course the candidates can either get employed, or become a self-employed / Entrepreneur in any one of the following fields.
 - 1) Alcohol production industries
 - 2) Beverage industries
 - 3) Soft drinks industries
 - 4) Audits helper
 - 5) Food legal advice business
 - 6) Students can start their own business like beverage manufacturing units, legal advice office etc.

In the third year, sixth semester is totally devoted for industrial training. In this semester student will be deputed to various industries for three months. There, these students will be trained to operate various machines to give useful productions. Industrialists will train them, according to their needs. Hence after the completion of the internship period these students will be “Industry fit” to get employed.

Duration:

The Duration of the B.Voc. Course will be of Three Years.

- **B.Voc. Part I - Diploma in Food Processing, Preservation and Storage**
- **B.Voc. Part II - Advanced Diploma in Food Processing, Preservation and Storage**
- **B.Voc. Part III - Bachelor of Vocation in Food Processing, Preservation and Storage**

The final B.Voc. degree will be awarded only after completion of three years course.

The suggested credits for each of the years are as follows:

Awards		Normal Calendar Duration	Skill Component Credits	General Education Credits
Year 1	Diploma in Food Processing, Preservation and Storage	Two Semester	36	24
Year 2	Advanced Diploma in Food Processing, Preservation and Storage	Four Semester	36	24
Year 3	B.Voc. in Food Processing, Preservation and Storage	Six Semester	36	24
		Total	108	72

Note

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practical's
3. Seminars
4. Private work in the Library/home
5. Examination
6. Industrial training
7. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials.
- For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops.
- For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

Eligibility:

1. The eligibility condition for admission to B.Voc. Program shall be **10+2 or equivalent**, in any stream **from any recognized board or university**.
2. The candidate with 10+2 year or ITI course in any branch is eligible for the course.
3. The merit list will be prepared as per the directives issued by the government, by considering the marks of qualifying examination.

Pattern: Semester Pattern

Examination:

Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)

- There are in all 10 papers per semester. Two theory and two practical papers for general education and 3 theories and 3 practical papers for skill education. Each paper will be of 75 marks each. Hence total marks of each semester will be of 750 marks.
- In the IIIrd. and Vth semester in addition to 10 papers mentioned above. Students will have to submit a project report on industrial training of one-month duration, they have undergone during the previous vacation. This project report will be accessed by the examiner appointed by university and will carry the weightage of 75 marks. Practical of these semester of skill education will carry the weightage of 50 marks each paper

➤ **Scheme of examination for a theory paper.**

Credits	Teaching Scheme	Examination Scheme			
		Theory Paper Hrs.	Continuous Assessment / Internal evaluation	End Semester Examination Marks	Total Marks
			Average of 2 Unit Test of 25 Marks Each		
03	04 Hrs.per week	2.50.Hrs.	25	50	75

➤ **Scheme of exam for a practical paper for sem I, II & IV.**

Credits	Teaching Scheme	Examination Scheme			
		Practical Paper Hrs.	Continuous Assessment/ Internal evaluation Marks	End Semester Examination Marks	Total Marks
03	03 Hrs.per week per paper	3.00.Hrs.	25	50	75

➤ **Scheme of exam for a practical paper for sem III & V.**

Credits	Teaching Scheme	Examination Scheme			
		Practical Paper Hrs.	Continuous Assessment/ Internal Evaluation	End Semester Examination Marks	Total Marks
02	03 Hrs. per week	3.00.Hrs.	10	40	50

➤ **Scheme of Examination for Project semi III & V.**

Credits	Teaching Scheme	Examination Scheme			
		Industrial Training. Marks	Project Work Marks	Seminar Marks.	End Semester Examination Total Marks
03	Industrial Training of 01 Month	50	15	10	75

➤ **Scheme of Examination for Project sem VI.**

Credits	Teaching Scheme	Examination Scheme			
		Industrial Training. Marks	Project Work Marks	Seminar Marks.	End Semester Examination Total Marks
03	Industrial Training of 03 Month	400	200	150	750

Question Paper Pattern
(Theory)

Q.1	Question	OR	15 M
Q.1	Question		15 M
Q.2	Question	OR	15 M
Q.2	Question		15 M
Q.3	Question	OR	10 M
Q.3	Question		10 M
Q.4	Question	OR	10 M
Q.4	Question		10 M

Question Paper Pattern (Practical) Semi I, II & IV

(Continuous Assessment = 25, End Sem. Exam = 50 , Total Mark = 75)

Question	Mark
Experiment	35
Viva	10
Record Book	05
Total marks	50

Question Paper Pattern (Practical) Semi III & V

(Continuous Assessment = 10 End Sem. Exam = 40, Total Mark = 50)

Question	Mark
Experiment	25
Viva	10
Record Book	05
Total marks	40

Course Structure for 3 years (6 Semester)

SEMESTER - I							
Sr. No.	Course Number	Course Title	Credit	Hours	C.A/ Internal Evaluation	Theory	Total marks
General Education							
1	BVGE-1	Introduction to Computer Hardware	3	45	25	50	75
2	BVGE-2	Introduction to Computer Application	3	45	25	50	75
3	BVGE-3	Practical on“Introduction to Computer Hardware”	3	45	25	50	75
4	BVGE-4	Practical on“Introduction to Computer Application”	3	45	25	50	75
Skill Education							
5	FPPS-111	Principles of Food Processing	3	45	25	50	75
6	FPPS-112	Food Chemistry	3	45	25	50	75
7	FPPS-113	Fundamentals of Microbiology	3	45	25	50	75
8	FPPS-114	Practical on “Principles of Food Processing”	3	45	25	50	75
9	FPPS-115	Practical on“Food Chemistry”	3	45	25	50	75
10	FPPS-116	Practical on “Fundamentals of Microbiology”	3	45	25	50	75
Total			30	450	250	500	750
SEMESTER – II							
Sr. No.	Course Number	Course Title	Credit	Hours	C.A/ Internal Evaluation	Theory	Total marks
General Education							
1	BVGE-5	Computer Operating Skills	3	45	25	50	75
2	BVGE-6	Communication and Documentation Skills	3	45	25	50	75
3	BVGE-7	Practical on“Computer Operating Skills”	3	45	25	50	75
4	BVGE-8	Practical on “Communication and Documentation Skills”	3	45	25	50	75
Skill Education							
5	FPPS-121	Cereal Processing	3	45	25	50	75
6	FPPS-122	Confectionary Technology	3	45	25	50	75
7	FPPS-123	Introduction to Food Microbiology	3	45	25	50	75
8	FPPS-124	Practical on“Cereal Processing”	3	45	25	50	75
9	FPPS-125	Practical on“Confectionary Technology”	3	45	25	50	75
10	FPPS-126	Practical on“Introduction to Food Microbiology”	3	45	25	50	75
Total			30	450	250	500	750

Activity:-Deputation of the students for industrial training of one month during vacation

SEMESTER – III							
Sr. No.	Course Number	Course Title	Credit	Hours	C.A/ Internal Evaluation	Theory	Total marks
General Education							
1	BVGE-9	Environmental Science	3	45	25	50	75
2	BVGE-10	Soft Skills and Personality Development	3	45	25	50	75
3	BVGE-11	Practical on “Environmental Science”	3	45	25	50	75
4	BVGE-12	Practical on “Soft Skills and Personality Development”	3	45	25	50	75
Skill Education							
5	FPPS-231	Legumes and Oilseeds Technology	3	45	25	50	75
6	FPPS-232	Processing of Milk and Milk Products	3	45	25	50	75
7	FPPS-233	Processing of Spices and Plantation Crops	3	45	25	50	75
8	FPPS-234	Practical on Legumes and Oilseeds Technology	2	45	10	40	50
9	FPPS-235	Practical on Processing of Milk and Milk Products	2	45	10	40	50
10	FPPS-236	Practical on Processing of Spices and Plantation Crops	2	45	10	40	50
11	FPPS-237	Project report on the industrial training completed during vacation at the end of II sem	3	45	--	--	75
		Total	30	450	205	470	750
SEMESTER – IV							
Sr. No.	Course Number	Course Title	Credit	Hours	C.A/ Internal Evaluation	Theory	Total marks
General Education							
1	BVGE-13	Introduction to Entrepreneurship	3	45	25	50	75
2	BVGE-14	Principles of Marketing Management	3	45	25	50	75
3	BVGE-15	Practical on “Introduction to Entrepreneurship”	3	45	25	50	75
4	BVGE-16	Practical on “Principles of Marketing Management”	3	45	25	50	75
Skill Education							
5	FPPS-241	Wheat Milling and baking Technology	3	45	25	50	75

6	FPPS-242	Meat, Poultry and Fish Technology	3	45	25	50	75
7	FPPS-243	Fruit and Vegetable Processing	3	45	25	50	75
8	FPPS-244	Practical on“Wheat Milling and baking Technology”	3	45	25	50	75
9	FPPS-245	Practical on“Meat, Poultry and Fish Technology”	3	45	25	50	75
10	FPPS-246	Practical on“Fruit and Vegetable Processing”	3	45	25	50	75
		Total	30	450	250	500	750

Activity: -Deputation of the students for industrial training of one month during vacation

SEMESTER –V							
Sr. No.	Course Number	Course Title	Credit	Hours	C.A/ Internal Evaluation	Theory	Total marks
General Education							
1	BVGE-17	Introduction to business management and Industrial laws	3	45	25	50	75
2	BVGE-18	Introduction to Business Accounting	3	45	25	50	75
3	BVGE-19	Practical on“Introduction to business management and Industrial laws”	3	45	25	50	75
4	BVGE-20	Practical on “Introduction to Business Accounting”	3	45	25	50	75
Skill Education							
5	FPPS-351	Food laws and regulation	3	45	25	50	75
6	FPPS-352	Food storage and logistics management	3	45	25	50	75
7	FPPS-353	Beverage and Extrusion technology	3	45	25	50	75
8	FPPS-354	Practical on “Food laws and regulation”	2	45	10	40	50
9	FPPS-355	Practical on “Food storage and logistics management”	2	45	10	40	50
10	FPPS-356	Practical on “Beverage and Extrusion technology”	2	45	10	40	50
11	FPPS-357	Project report on the industrial training completed during vacation at the end of IVsem	3	45	---	---	75
Total			30	450	205	470	750

SEMESTER –VI					
Course Number	Name of Subject	Credit	Hrs./ Duration	Marks	Total marks
FPPS-361	In-plant Training	30	3 Months	400	750
	Project work			200	
	Seminar			150	
	Total	30		750	750

Revised Syllabus IInd Year

III rd and IV Semester

Effective from June 2020

Semester III General Education

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : ENVIRONMENTAL SCIENCE
CONTENTS : THEORY
SUBJECT CODE : BVGE-9
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective

- To aware the students of world environmental problems, students should acquaint basic knowledge of environment and its components.
- To solve the environmental problems, it is necessary to develop and invent new advanced technologies to control environmental pollution.

Learning Outcomes:

- Student will possess the intellectual flexibility necessary to view environmental question from multiple perspectives, prepare to alter their understanding as they learn new ways of understanding.

Contents:-

SR. No.	Topic name	Number of Hours	Marks
1	Unit I Multidisciplinary nature of environmental studies Definition, scope and importance, need for public awareness. Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	5	15

	<p>Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.</p> <p>Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.</p> <p>vii. Role of an individual in conservation of natural resources.</p> <p>viii. Equitable use of resources for sustainable lifestyles.</p>		
2	<p>Unit II</p> <p>Ecosystems: • Introduction, types, characteristic features, structure and function Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, of the following ecosystems :- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems(ponds, streams, lakes, rivers, oceans, estuaries)</p>	10	15
3	<p>Unit III</p> <p>Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity, Biogeographically classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot-spots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</p>	10	15
4	<p>Unit IV</p> <p>Environmental Pollution: Definition, Cause, effects and control measures Of: - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides.</p>	10	10
5	<p>Unit V</p> <p>Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns. Case Studies, Environmental ethics: Issues and possible</p>	5	10

	solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies, Wasteland reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act , Wildlife Protection Act , Forest Conservation Act , Issues involved in enforcement of environmental legislation, Public awareness.		
6	Unit VI Human Population and the Environment: Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health, Case Studies.	5	10
	Total	45	75

Reference Books;

1. Agarwal, K.C. (2001). Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmadabad –380 013, India, Email:mapin@icenet.net (R)
3. Brunner R.C. (1989), Hazardous Waste Incineration, McGraw Hill Inc. 480p
4. Clark R.S., Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001,
6. Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down to Earth, Centre for Science and Environment (R)

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : SOFT SKILLS AND PERSONALITY DEVELOPMENT
CONTENTS : THEORY
SUBJECT CODE : BVGE-10
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective: -

- This course helps students to select their professional career as per their inborn qualities and potential, and also this course develops many soft skills in students which are essential in all types of career.

Learning Outcome: -

Contents:-

SR. No.	Topic name	Number of Hours	Marks
1	Unit I:- 1. Skill of selection career 2. Finding out inborn qualities and interest. 3. Interest- attraction or love 4. Entrepreneurship: definition, definition of entrepreneur, qualities of entrepreneur, scope and limitations of entrepreneurship 5. Business:- definition of business, definition of businessman, qualities of businessman, scope and limitations of businessman. 6. Service: definition of service, service sectors in India and Abroad, scope and limitation of service	5	15
2	Unit II Spoken English a) Vocabulary building *Listening, *Reading, *Writing, *Speaking b) Basic pattern of Sentence *Present tense, *Past tense, *Future tense c) Art of asking questions * Question starting with helping verb	10	15
3	Unit III:- Stage Courage and Presentation skill a) Stage courage development b) Selection of topic c) Self introduction	10	15

	d) Presenting our self e) Appreciation f) Opening, middle explanation and closing g) Importance of curiosity in presentation		
4	Unit IV:- Communication Skill a) Enthusiasm b) Pure listening and pure response c) Body language d) Open ended communication and close ended communication e) Yes or yes technology	10	10
5	Unit V:- Leadership and Team Management a) Definition of leader b) Qualities of leader c) Duties of leader d) Definition of team e) Importance of team f) Formation of team g) Management of team	5	10
6	Unit VI:-Personality Development a) Definition of personality b) External factors affecting personality c) Internal factors affecting personality d) Meditation e) Use of meditation as a tool to achieve health, wealth and happined	5	10
	Total	45	75

Reference Books:-

1. Seven habits of highly effective peoples – Stephen Covey
2. You can heal your life – Dr. Lueis Hey
3. How to win and influence people – Dell Karnogi
4. Granthawali- Swami Vivekananda
5. Rich Dad Poor Dad – Robert Kiwasoki
6. Marketing Management – Philip Kotler
7. You can win – Shiv khera
8. Body language – Dr. UjwalPatani
9. How I raised my self from failure to success – Frank Betgar
10. Agnipankh – Dr. A.P.J. Abdul Kalam.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PRACTICAL ON ENVIRONMENTAL SCIENCE
CONTENTS : PRACTICAL
SUBJECT CODE : BVGE-11
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Environment and its analysis
2. Water quality parameters
3. Determination of pH of water samples
4. Determination of acidity of water
5. Determination of Alkalinity of water sample
6. Measurement of turbidity of water samples
7. Visit to a local area to document environmental assets, river/forest/grasslands
8. visit to a local polluted site(Enlisting the types of pollutants/wastes visible in nilanga,)
9. Study of common plants, insects, birds. Documenting the special resource features of individual ecosystems. (river/ forest)
10. Study of simple ecosystems. Observing the energy cycle - by looking different types of insects and birds in the trees.

Reference Books;

1. Agarwal, K.C. (2001). Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd.,
3. Ahmedabad –380 013, India, Email:mapin@icenet.net (R)
4. Brunner R.C. (1989), Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001,
7. Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
8. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
9. Down to Earth, Centre for Science and Environment (R)

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PRACTICAL ON SOFT SKILLS AND PERSONALITY DEVELOPMENT
CONTENTS : PRACTICAL
SUBJECT CODE : BVGE-12
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's: -

- 1. Project presentation**
Case study on any successful person in particular profession
(Entrepreneurship, business, service)
- 2. Project presentation**
Self case study and future projection about your professional career
- 3. Conversation on daily situation (Group discussion)**
- 4. Eye to eye contact and story explanation**
- 5. Making of PPT and giving presentation on given topic**
- 6. Cold canvassing and filling survey forms (Taking and giving interview)**
- 7. Activity based on competition (Indoor) (*Drama presentation)**
- 8. Activity based on competition (Outdoor) (*Sport activity)**
- 9. Meditation (Best personality competition)**

Reference Books:-

1. Seven habits of highly effective peoples – Stephen Covey
2. You can heal your life – Dr. Lueis Hey
3. How to win and influence people – Dell Karnogi
4. Granthawali- Swami Vivekananda
5. Rich Dad Poor Dad – Robert Kiwasoki
6. Marketing Management – Philip Kotler
7. You can win – Shiv khera
8. Body language – Dr. Ujwal Patani
9. How I raised my self from failure to success – Frank Betgar
10. Agnipankh – Dr. A.P.J. Abdul Kalam

Skill Education

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : LEGUMES AND OILSEEDS TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : FPPS-231
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective:

- To acquaint with production and consumption trends, structure, composition, quality evaluation, and processing technologies for product development and value addition of various pulses and oilseeds.

Learning Outcome:

- Know about different legumes processing aspects and preparation of products with legumes and oil seeds.
- Learn about different oil seeds, oil milling by expellers, solvent extraction of oils, refining of oils and utilization of oil seed meals for different food uses

Contents:-

SR.No.	Topic name	Number of Hours	Marks
1	Unit-I Present status and future prospects of legumes and oilseeds; Morphology of legumes and oilseeds; Classification and types of legumes and oilseeds	15	15
2	Unit-II Anti-nutritional compounds in legumes and oilseeds; Methods of removal of anti-nutritional compounds	5	10
3	Unit-III Milling of legumes: home scale, cottage scale and modern milling methods, milling quality, efficiency and factors affecting milling; problems in dhal milling industry	5	10

	Soaking and germination of pulses		
4	Unit-IV Cooking quality of legumes – factors affecting cooking quality	8	15
5	Unit-V Oilseeds: composition, methods of extraction Desolventization and refining of oils: degumming, neutralization bleaching, filtration, deodorization, etc. New technologies in oilseed processing	7	15
6	Unit-VI Utilization of oil seed meals for food uses i.e. high protein products like concentrate, isolates By-product of pulses and oil milling and their value addition.	5	10
	Total	45	75

Reference Books:

1. Pulses, Agro tech Pub. Academy, 2005 - Harbhajan Singh
2. Legumes Chemistry, Technology and Human Nutrition II-Marcel Dekker, 1989 - Mathews RH
3. Post harvest technology of cereals: pulses and oilseeds, Oxford & ibh publishing company, 1988- Chakraverty A.
4. Bailey's Industrial Oil & Fat Products, Wiley Publciation, 2005- Bailey A.E. and Shahidi F.
5. Food and Feed from Legumes and Oilseeds, Springer, 2012 - Smartt J and Nwokolo E.
6. Legumes and Oilseed Crops, Springer, 2012 - Bajaj YPS
7. Handbook of Seed Science and Technology, CRC Press, 2006 - Basra A.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PROCESSING OF MILK AND MILK PRODUCTS
CONTENTS : THEORY
SUBJECT CODE : FPPS-232
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objectives:

- To acquaint with techniques and technologies of testing and processing of milk into various products and byproducts.

Learning Outcome:

- Maintain hygiene and cleanliness of floor dairy equipment's.
- Operate machineries used in dairy plant and understand the basic milk product market and raw materials.
- Perform various tests conducted on milk in dairy industries.

Contents:-

SR. No.	Topic name	Number of Hours	Marks
1	Unit-I Milk and milk products in India; Importance of milk processing plant in the country	5	10
2	Unit-II Handling and maintenance of dairy plant equipment. Dairy plant operations viz. receiving, separation, clarification, pasteurization, standardization, homogenization, sterilization, storage, transport and distribution of milk	10	15
3	Unit-III Problems of milk supply in India. UHT, toned, humanized, fortified, reconstituted and flavoured milks	10	12

4	Unit-IV Technology of fermented milks (starter culture, dahi, yoghurt, shrikhand); Milk products processing viz. cream, butter, <i>ghee</i> , cheese, condensed milk, evaporated milk, whole and skimmed milk powder	10	13
5	Unit-V Ice-cream, butter oil, <i>khoa</i> , <i>channa</i> , <i>paneer</i> and similar products Judging and grading of milk products	5	10
6	Unit-VI Insanitization viz. selection and use of dairy cleaner and sanitizer Dairy plant sanitation and waste disposal	5	15
	Total	45	75

Reference Books:

1. Outline of Dairy Technology, Oxford University Press, 2008 - Sukumar De
2. The Fluid Milk Industry, AVI Publishing Co, USA -Henderson JL
3. Indian Dairy Industry, Asia publishing house, Mumbai - K.S. Rangappa and K L Acharya
4. Technology of Milk Processing, ICAR, New Delhi -Khan QA and Padmanabhan
5. Principles of Dairy Processing, Wiley Eastern Ltd, New Delhi - J.N. Warner,
6. Dairy Technology: Principles of milk properties and processes, CRC Press, 1999 - Walstra P.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PROCESSING OF SPICES AND PLANTATION CROPS
CONTENTS : THEORY
SUBJECT CODE : FPPS-233
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objectives:

To learn and understand the different spices and their functional components present in the spices and known different techniques for processing

Learning Outcome:

- Student will enable to understand different processing techniques of spices.
- To learn and understand the various spice components used in foods along with their role and properties

Contents:-

SR. No.	Topic name	Number of Hours	Marks
1	Unit I: Production and processing scenario of spice, flavour & plantation crops and its scope	10	15
2	Unit II : Major spices: Post harvest technology, composition, processed products of spices – ginger, chilli, turmeric, onion, garlic, pepper, cardamom, cashew nut and coconut Minor spices, herbs and leafy vegetables: processing and utilization, All spice, annie seed, sweet basil, caraway seed, cassia, cinnamon, clove, coriander, cumin, dill seed, Fern seed nutmeg, mint, marjoram, Rose merry, saffron, sage, etc	10	25
3	Unit III Tea, Coffee, Cocoa: Processing quality control	10	15
4	Unit IV: Vanilla and annatto-processing Spice oil and oleoresins	10	15
5	Unit V:	5	5

	Standards specification of spices and flavours		
	Packaging of spices and spice products		
	Total	45	75

Reference Books:

1. Spices and Plantation Crops, Agrotech Publication, Delhi - K.G. Shanmugavelu
2. Spice and Condiments, National Book Trus, 1996 -Pruthi J.S.
3. Handbook on Spices and Condiments (cultivation, processing and extraction), Asia Pacific Business Press Inc. 2010 -Panda H.
4. Spices and Seasonings: A Food Technology Handbook, John Wiley and Sons, 2001 - Tainter DR and Grenis AT
5. The Book of Spices, Pyramid Books, 1973 - Rosengarten F.
6. Spices and Herbs for the Food Industry, Food Trade Press, 1984 -Lewis YS

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PRACTICAL ON LEGUMES AND OILSEEDS
TECHNOLOGYCONTENTS : PRACTICAL
SUBJECT CODE : FPPS-234
MARKS : 50 MARKS
TOTAL HRS : 45

List of the Practical's

1. Determination of physical properties of legumes/oilseeds
2. Determination of anti-nutritional factors in legumes
3. Cooking quality of dhal
4. Puffing of legumes
5. Milling of legumes
6. Preparation of composite legume flour
7. Preparation of soy milk and soy paneer
8. ProductionPreparation of protein isolate
9. Preparation of quick cooking dhal
10. Measurement of physico-chemical properties of oils
11. Hydrogenation of oil
12. Measurement of melting point of fats
13. Preparation of peanut butter
14. Visit to dhal mill and oil mill

Reference Books:

1. Pulses, Agro tech Pub. Academy, 2005 - Harbhajan Singh
2. Legumes Chemistry, Technology and Human Nutrition II-Marcel Dekker, 1989 - Mathews RH
3. Post harvest technology of cereals: pulses and oilseeds, Oxford &ibh publishing company, 1988- Chakraverty A.

4. Bailey's Industrial Oil & Fat Products, Wiley Publciation, 2005- Bailey A.E. and Shahidi F.
5. Food and Feed from Legumes and Oilseeds, Springer, 2012 - Smartt J and Nwokolo E.
6. Legumes and Oilseed Crops, Springer, 2012 - Bajaj YPS
7. Handbook of Seed Science and Technology, CRC Press, 2006 - Basra A.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PRACTICAL ON PROCESSING OF MILK AND MILK PRODUCTS
CONTENTS : PRACTICAL
SUBJECT CODE : FPPS-235
MARKS : 50 MARKS
TOTAL HRS : 45

List of the Practical's

1. Sampling of milk and milk production
2. Milk testing
3. Determination of fat content of milk
4. Detection of adulterants in milk and milk products
5. Standardization of milk
6. Heat processing of milk – Pasteurization
7. Preparation of butter
8. Preparation of ghee
9. Preparation of ice-cream
10. Preparation of coagulated milk product (paneer)
11. Preparation of indigenous fermented milk products (dahi, Shrikhand, etc)
12. Preparation of khoa
13. Preparation of khoa based sweet
14. Preparation of channa
15. Preparation of channa based sweet (*Rasogulla*)
16. Visit to dairy plant

Reference Books:

1. Outline of Dairy Technology, Oxford University Press, 2008 - Sukumar De
2. The Fluid Milk Industry, AVI Publishing Co, USA -Henderson JL
3. Indian Dairy Industry, Asia publishing house, Mumbai - K.S. Rangappa and K L Acharya
4. Technology of Milk Processing, ICAR, New Delhi -Khan QA and Padmanabhan
5. Principles of Dairy Processing, Wiley Eastern Ltd, New Delhi - J.N. Warner,
6. Dairy Technology: Principles of milk properties and processes, CRC Press, 1999 - Walstra P.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : THIRD
SUBJECT TITLE : PRACTICAL ON PROCESSING OF SPICES AND PLANTATION CROPS
CONTENTS : PRACTICAL
SUBJECT CODE : FPPS-236
MARKS : 50 MARKS
TOTAL HRS : 45

List of the Practical's

1. Physicochemical properties of different spices
2. Study of standard specification of spices
3. Study on Curing of ginger
4. Detection of adulteration in spices
5. Determination of piperine content of black pepper
6. Picrocrocine, safranal and crocine content
7. Test for presence of chromate
8. Extraction of oil/ oleoresins from spices
9. Steam distillation of spices for essential oil
10. Determination of curcumin content in turmeric
11. Preparation of curry powder
12. Preparation of Indian *Masala* for different foods
13. Visit to spice industry

Reference Books:

1. Spices and Plantation Crops Agrotech Publication, Delhi - K.G. Shanmugavelu
2. Spice and Condiments, National Book Trus, 1996 -Pruthi J.S.
3. Handbook on Spices and Condiments (cultivation, processing and extraction), Asia Pacific Business Press Inc. 2010 -Panda H.
4. Spices and Seasonings: A Food Technology Handbook, John Wiley and Sons, 2001 -Tainter DR and Grenis AT
5. The Book of Spices, Pyramid Books, 1973 - Rosengarten F.
6. Spices and Herbs for the Food Industry, Food Trade Press, 1984 -Lewis YS

COURSE NAME: B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE

SEMESTER : THIRD

SUBJECT TITLE : PROJECT REPORT ON THE INDUSTRIAL TRAINING COMPLETED DURING VACATION AT THE END OF II SEM

CONTENTS : SUMMER VOCATIONAL TRAINING

SUBJECT CODE : FPPS-237

MARKS : 75 MARKS

TOTAL HRS : 45

OBJECTIVES:-

- a) To expose the students to Industrial environment, which cannot be simulated in the university
- b) To familiarize the students with various Materials, Machines, Processes, Products and their applications along with relevant aspects of shop management
- c) To make the students understand the psychology of the workers, and approach to problems along with the practices following at factory
- d) To make the students understand the scope, functions and job responsibility-ties in various department of an organization
- e) Exposure to various aspects of entrepreneurship during the programme period

Scheme of Examination for Project semi III

Credits	Teaching Scheme	Examination Scheme			
		Industrial Training. Marks	Project Work Marks	Seminar Marks.	End Semester Examination Total Marks
03	Industrial Training of 01 Month	50	15	10	75

IV Semester General Education

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE

SEMESTER : FOURTH

SUBJECT TITLE : INTRODUCTION TO INTREPRENEURSHIP

CONTENTS : THEORY

SUBJECT CODE : BVGE-13

MARKS : 75 MARKS

TOTAL HRS : 45

LEARNING OBJECTIVES: -

- To understand the concept and need of entrepreneurship
- To create awareness amongst students about entrepreneurship
- To motivate students towards rising opportunities in entrepreneurship
- To provide updated knowledge about skill development and entrepreneurial development initiatives

LEARNING OUTCOME: -

Student will be encouraged to be an entrepreneur.

Contents: -

SR. No.	Topic name	Number of Hours	Marks
1	UNIT I: Introduction to Entrepreneurship Meaning and concepts of entrepreneur and entrepreneurship, characteristics of a good entrepreneur, classification of entrepreneurs, role of entrepreneurship in economic development	10	15
2	UNIT II : Micro, small and medium Enterprises(MSME) Meaning, Definitions and concept micro, small and medium enterprise, nature and scope of MSMEs, Role of MSMEs in industrial development, problems of micro and small enterprise.	15	20
3	UNIT III : Financing for MSMEs Meaning and need of financial planning, sources of finance, capital structure and factors affecting on capital structure, management of working capital, short term	10	20

	finance for MSMEs		
4	UNIT IV: Entrepreneurship Development: Recent Trends Women entrepreneurship, social entrepreneurship, joint ventures, role of govt. in entrepreneurship development, start-up Indian, stand up India, Mudra Yojana, Skill India.	10	20
	Total	45	75

Recommended Books:

1. Vasant Desai, - Dynamics of Entrepreneurial development and management, Himalaya publishing house, Mumbai
2. Dr. C.B. Gupta and Dr. P.N. Srinivasan – Entrepreneurship developments in India, S. chand and sons, New Delhi
3. E. Gordan and K. Natrajan, Entrepreneurship development, Himalaya publication House, Mumbai.
4. Anita H.S., Entrepreneurship development, role of commercial Banks, Mangal deep publication, Jaipur.
5. S.S. Khanka – Entrepreneurial development, S. chand publication, New Delhi

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRINCIPLES OF MARKETING MANAGEMENT
CONTENTS : THEORY
SUBJECT CODE : BVGE-14
MARKS : 75 MARKS
TOTAL HRS : 45

LEARNING OBJECTIVES: -

- To introduce students to basics of marketing
- To provide knowledge about recent marketing trends
- To provide practical knowledge about different marketing practices

LEARNING OUTCOME: -

- An introduction to the concepts and principles of marketing. The paper is designed to develop a basic understanding of consumers, market analysis, marketing planning, and marketing management.

CONTENT:-

SR. No.	Topic name	Number of Hours	Marks
1	UNIT I: Introduction to Marketing Meaning, Definitions and concepts of marketing, nature and scope of marketing, evolution of marketing significance and objective of marketing, difference between marketing and sales. Marketing management in India. planning, process of marketing planning,	10	15
2	UNIT II : Marketing Planning Meaning, Definitions of marketing planning, objective of marketing planning, process of marketing planning, types of marketing planning, marketing programme: concept, factors affecting marketing programme.	15	20
3	UNIT III : Marketing Decisions Products Decision – concept, process and classification Price Decision – concept, significance and factors affecting pricing decisions.	10	20

	Physical Distribution – concept, importance and function of distribution decisions Promotion Decision – concept of sales promotion, importance of sales promotion, system of sales promotion.		
4	UNIT IV: Recent Trends in Marketing and Advertisements Meaning and concept of advertisement, need and importance of advertisement, e-marketing, digital marketing, social media marketing, green marketing, rural marketing, challenges in marketing	10	20
	Total	45	75

Recommended Books:

1. Philip Kotler- Marketing Management, Prentice hall of India, New Delhi.
2. Sherlekar S.A. – Marketing Management, Himalaya Production House, Mumbai.
3. Karunakar K. - Marketing Management, Himalaya Production House, Mumbai
4. Dr.PrabhakarDeshmukh – Marketing Management, VidyaPrakashan, Nagpur
5. Dr. V.S. Kadvekar - Marketing Management, Diamond Publication, Pune.
6. Dr. Mahesh Kulkarni and Dr.PramodBiyani – Marketing and Salesmanship, NiraliPrakashan, Pune

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRACTICAL ONINTRODUCTION TO INTREPRENEURSHIP
CONTENTS : PRACTICAL
SUBJECT CODE : BVGE-15
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Field visit and study tours
2. Meeting with entrepreneurs
3. Project report
4. Power-points presentation
5. Assignments and tutorials
6. Study tour reports

Recommended Books:

1. Vasant Desai, - Dynamics of Entrepreneurial development and management, Himalaya publishing house, Mumbai
2. Dr. C.B. Gupta and Dr. P.N. Srinivasan – Entrepreneurship developments in India, S. chand and sons, New Delhi
3. E. Gordan and K. Natrajan, Entrepreneurship development, Himalaya publication House, Mumbai.
4. Anita H.S., Entrepreneurship development, role of commercial Banks, Mangal deep publication, Jaipur.
5. S.S. Khanka – Entrepreneurial development, S. chand publication, New Delhi

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRACTICAL ON PRINCIPLES OF MARKETING MANAGEMENT
CONTENTS : PRACTICAL
SUBJECT CODE : BVGE-16
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Survey of the local market
2. Survey of the local industries
3. Survey of the sales promotion methods
4. Visit to advertising agencies
5. Project report on marketing
6. Question naive designing
7. Data collection and analysis regarding marketing of different products.
8. Observation of different TV advertisement
9. Seminars and power point presentation
10. Assignments
11. Projects on product design, branding and advertisement
12. Group Discussions.

Recommended Books:

1. Philip kolter- Marketing Management, Prentice hall of India, New Delhi.
2. Sherlekar S.A. – Marketing Management, Himalaya Production House, Mumbai.
3. Karunakar K. - Marketing Management, Himalaya Production House, Mumbai
4. Dr. Prabhakar Deshmukh – Marketing Management, Vidya Prakashan, Nagpur
5. Dr. V.S. Kadvekar - Marketing Management, Diamond Publication, Pune.
6. Dr. Mahesh Kulkarni and Dr.Pramod Biyani – Marketing and Salesmanship, Nirali Prakashan, Pune

Skill Education

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : WHEAT MILLING AND BAKING TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : FPPS- 241
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective

- To acquaint the students with the knowledge and processing of Wheat and their utilization in various products.

Learning Outcomes:

- Students will learn to appreciate the complex nature of flour and the intricacies of modern baking technology.
- Students will develop competency to critically evaluate quality of finished baked products in terms of underlying properties of flour, dough/batter, ingredient function, product formulation and processing, and molecular mechanisms.

Contents: -

SR.No.	Topic name	Number of Hours	Marks
1	UNIT-I Wheat – importance, production varieties used for cultivation Types of wheat, grading and quality of wheat	10	15
2	UNIT-II Structure of wheat, chemical constituents and their distribution Physico-chemical and Rheological properties Enzymes in wheat, damage of wheat Conditioning of wheat – principles and methods of conditioning	10	20
3	UNIT-III Milling of wheat: Rolling flour milling process; break rolls; reduction rolls; Design and operation, wheat milling process Products of wheat milling industry: Flour, atta, etc. flour grades, supplementation, Fortification	10	15

	Flour additives, flour improvers, Bleaching, Oxidizing agents		
4	UNIT-IV Bakery products, role of bakery ingredients (major and minor), from hard wheat: bread processes of bread making using straight and sponge, dough methods role of each ingredient, quality control Testing of raw material testing of final product Defects in bread; staleness, roppines. Baked product from soft wheat; cookies, crackers, biscuits, cakes – ingredients, process, fault causes and remedy	10	15
5	UNIT-V Other bakery products: using very hard wheat. Pizza, pastry and its types. Macaroni products: Including spaghetti, noodles, and vermicelli-process. Nutritional improvement of bakery products Setting of bakery unit, bakery norms, specifications for raw materials Packaging, marketing of products, preparation of project report	5	10
	Total	45	75

Reference Books

1. Bakery Science and Cereal Technology, Daya Books, New Delhi 2005 - Khetarpaul.
2. Technology of Cereals, Utilization of Rice- Luh.Kent.
3. Flour Milling Process Chapman & Hall, 1951-Scott J.H.
4. Bakery Products Science and Technology, John Wiley and Sons, 2014-Zhou and Hui
5. Modern Bakery Products, EIRI Publication, New Delhi- EIRI
6. Dough Wheat and Baked Products, Springer, 2012-Faridi and Faubin
7. Baked Products, Asia publishing house, Mumbai Stanley PC and Linda SY

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : MEAT, POULTRY AND FISH TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : FPPS-242
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective

- To provide an understanding of the technology for handling, processing, preservation and by-product utilization of meat, poultry and fish products processing.

Learning Outcomes:

- Understand the technology for raw material characteristics, handling, processing, and preservation of meat and meat products.
- Perceive the knowledge regarding transportation and storage practices.
- Prepare various value added products.

Contents: -

SR. No.	Topic name	Number of Hours	Marks
1	Unit I Sources and developments of meat and poultry industries in India and importance in national economy Muscle structure, chemical composition and physico-chemical properties of meat muscle. Abattoir design and layout	5	10
2	Unit II Pre-slaughter transport and care and antimortem inspection Slaughtering of animals and poultry, post-mortem inspection and grading of meat Factors affecting post-mortem changes, properties and shelf life of meat	10	15
3	Unit III Egg structure: Composition, quality characteristics, processing and preservation of eggs Processing and preservation of meat- mechanical deboning, aging or chilling, freezing, pickling, curing, cooking and smoking of meat	10	15

4	Unit IV Meat tenderization. – principles and methods Traditional, batch and continuous Method of preparation, Technology of manufacture of meat and poultry products	10	15
5	Unit V Meat plant sanitation and safety; By-products utilization of abattoir	5	10
6	Unit VI Classification of fish (fresh water and marine), composition of fish, characteristics of fresh fish. Fish products: surimi; Fish protein concentrates (FPC); Fish protein extracts (FPE), fish protein hydrolysates (FPH)	5	10
Total		45	75

Reference Books;

1. Principles of Meat Science, Kendall Hunt Publication - Aberle E.D.
2. Principles of Meat Technology, New India Publishing Agency, Delhi - Singh V. P.
3. Handbook of Meat and Meat Processing, CRC Press, New York - Hue Y.H.
4. Poultry Production, Khyani Publishers, Delhi -Singh R. A.
5. Fish Processing Technology, Springer Publication -Hall G.M.
6. Outlines of Meat Science and Technology, Jaypee Brother Medical Publishers -
Sharma B.D.

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : FRUITS AND VEGETABLES PROCESSING
CONTENTS : THEORY
SUBJECT CODE : FPPS 243
MARKS : 75 MARKS
TOTAL HRS : 45

Learning Objective

- To enable the students to know the post-harvest management systems and processing technologies for preservation of fruits & vegetables and various value added products.

Learning outcomes: -

- To develop proficiency skill in producing different types of processed fruits & vegetables products.
- Operating & maintenance the modern processing equipment's & machineries
- To make different processed fruit & vegetable based products with quality assurance and safety.
- Process of packaging, storing & marketing

Contents:-

SR. No.	Topic name	Number of Hours	Marks
1	UNIT I: Production and processing scenario of fruits and vegetables in India and World Scope of fruit and vegetable preservation industry in India. present status, constraints and prospects	5	15
2	UNIT II: Overview of principles and preservation methods of fruits and vegetables Commercial processing technology of fruits and vegetables Primary processing and pack house handling of fruits and vegetables; Peeling, slicing, cubing, cutting and other size reduction operations for fruits and vegetables	10	15
3	UNIT III: Minimal processing of fruits and vegetables Blanching operations and equipment	10	15

4	UNIT IV: Canning: Definition, processing steps, and equipment, cans and containers, quality assurance and defects in canned products Preparation and preservation of juices, squashes, syrups, sherbets, nectars, cordials, etc; problems in squash and RTS; processing and equipment for above products and FSSAI specification	10	15
5	UNIT V: Preparation, preservation and machines for manufacture of crystallized fruits and preserves, jam, jelly and marmalades, problems, candies; Preparation, preservation and machines for manufacture of preserve, concentrate, fruit wine, sauerkraut, chutney, pickles, sauce, puree, paste, ketchup; toffee, cheese, lather, dehydrated, wafers and papads, soup powders; FSSAI specification Production of pectin and vinegar; Commercial processing technology of selected fruits and vegetables for production of various value added processed products	10	15
	Total	45	75

Reference Books:

1. Fruit and Vegetable Preservation Principles and Practices, International Book Distributing Company, New Delhi 2005- Srivastava R.P. and Sanjeev Kumar.
2. Post Harvest Technology of Fruits and Vegetables: Handling, Processing, Fermentation and Waste Management vol. I & II, Indus Publishing, 2000 - Varma L. R. and Joshi V.K.
3. Preservation of Fruits and Vegetables, ICAR, New Delhi 2010 - Khader
4. Preservation of Fruits and Vegetable, ICAR Publication, New Delhi 1996 - G. Lal, G.S. Siddappa, G.L. Tandan

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRACTICAL ON WHEAT MILLING AND BAKING TECHNOLOGY
CONTENTS : PRACTICAL
SUBJECT CODE : FPPS-244
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Classification of wheat based on physico-chemical properties
2. Determination of gluten content of wheat
3. Determination of dough rising capacity
4. Determination of Pelshanke Value
5. Determination of sedimentation value
6. Determination of falling number
7. Determination of alcoholic acidity of flour
8. Preparation of bread
9. Evaluation of quality parameters of bread
10. Preparation of biscuit
11. Evaluation of physical properties of cookies
12. Preparation of sponge cake
13. Visit to wheat milling industry, visit to bakery unit

Reference Books

1. Bakery Science and Cereal Technology, Daya Books, New Delhi 2005 - Khetarpaul.
2. Technology of Cereals, Utilization of Rice- Luh.Kent.
3. Flour Milling Process Chapman & Hall, 1951-Scott J.H.
4. Bakery Products Science and Technology, John Wiley and Sons, 2014-Zhou and Hui
5. Modern Bakery Products, EIRI Publication, New Delhi- EIRI
6. Dough Wheat and Baked Products, Springer, 2012-Faridi and Faubin
7. Baked Products, Asia publishing house, Mumbai Stanley PC and Linda SY

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRACTICAL ON MEAT, POULTRY AND FISH TECHNOLOGY
CONTENTS : PRACTICAL
SUBJECT CODE : FPPS-245
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Slaughtering and dressing of poultry bird
2. Slaughtering and dressing of goat
3. Determination of water holding capacity of meat
4. Determination of extract release volume
5. Determination of meat pH
6. Preparation of meat products
7. Preparation of blood meal
8. Tenderization of meat
9. Composition and structure of egg
10. Determination of egg quality by Haugh unit
11. Preservation of shell egg
12. Study of anatomy and dressing of fish
13. Preparation of fish protein concentrate (FPC)
14. Visit to slaughter house

Reference Books;

1. Principles of Meat Science, Kendall Hunt Publication - Aberle E.D.
2. Principles of Meat Technology, New India Publishing Agency, Delhi - Singh V. P.
3. Handbook of Heat and Meat Processing, CRC Press, New York - Hue Y.H.
4. Poultry Production, Khyani Publishers, Delhi -Singh R. A.
5. Fish Processing Technology, Springer Publication -Hall G.M.
6. Outlines of Meat Science and Technology, Jaypee Brother Medical Publishers - Sharma B.D

COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE
SEMESTER : FOURTH
SUBJECT TITLE : PRACTICAL ON FRUITS AND VEGETABLES PROCESSING
CONTENTS : PRACTICAL
SUBJECT CODE : FPPS-246
MARKS : 75 MARKS
TOTAL HRS : 45

List of the Practical's:-

1. Primary processing of selected fruits and vegetables
2. Canning of mango/guava/ papaya
3. Preparation of jam/ jelly/ marmalade from selected fruit
4. Preparation of RTS beverage
5. Preparation of squash
6. Preparation of grape raisins
7. Preparation of dried fig / banana fig
8. Techniques of sorting grading for fruits and vegetables
9. Preparation of fruit candy
10. Osmotic dehydration of fruit slices
11. Preparation of fruit leather
12. Preparation of fruit toffee
13. Preparation of pickle
14. Preparation of dried onion/garlic/ginger
15. Preparation of banana/ potato wafers
16. Preparation of dehydrated tomato powder
17. Visit to fruits and vegetables processing unit

Reference Books:

1. Fruit and Vegetable Preservation Principles and Practices, International Book Distributing Company, New Delhi 2005- Srivastava R.P. and Sanjeev Kumar.
2. Post Harvest Technology of Fruits and Vegetables: Handling, Processing, Fermentation and Waste Management vol. I & II, Indus Publishing, 2000 - Varma L. R. and Joshi V.K.
3. Preservation of Fruits and Vegetables, ICAR, New Delhi 2010 - Khader
4. Preservation of Fruits and Vegetable , ICAR Publication, New Delhi 1996 - G. Lal, G.S. Siddappa, G.L. Tandan.