।। सा विद्या या विमुक्तये ।।

# स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

"ज्ञानतीर्थ" परिसर, विष्णुपूरी, 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

25 1994 - 2019 SILVER JUBILEE YEAR

## ACADEMIC (1-BOARD OF STUDIES) SECTION

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**संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.**

# प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या मा. विद्या परिषद बैठकीतील ऐनवेळचा विषय क्र.११/४४–२०१९** च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्यात येत आहेत.

1. Agricultural Microbiology
2. Agrochemicals & Fertilizers
3. Analytical Chemistry
4. B.C.A.
5. B.Voc. (Food Processing, Preservation and Storage)
6. B.Voc. (Web Printing Technology)
7. Biochemistry
8. Bioinformatics
9. Biophysics
10. Biotechnology (Vocational)
11. Biotechonology
12. Botany
13. Chemistry
14. Computer Application (Optional)
15. Computer Science (Optional)
16. Computer Science
17. Dairy Science
18. Dyes and Drugs
19. Electronics
20. Environmental Science
21. Fishery Science
22. Food Science
23. Geology
24. Horticulture
25. Industrial Chemistry
26. Information Technology (Optional)
27. Mathematics
28. Microbiology
29. Network Technology
30. Physics
31. Software Engineering
32. Statistics
33. Zoology

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–०१/परिपत्रक/पदवी–सीबीसीएस अभ्यासक्रम/२०१९–२०/**२९२**

**दिनांक** : ०३.०७.२०१९.

स्वाक्षरित/–
**उपकुलसचिव**
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

# Maharashtra Mahavidyalaya, Nilanga,

# Dist: Latur.

**Affiliated to**

***Swami Ramanand Teerth Marathwada University, Nanded***

## B.Vocational (Food Processing, Preservation and Storage)

## Syllabus I$^{st}$ Year

***Effective from the academic year June 2019***

## Curriculum for Bachelor of Vocational (B. Voc.) in Food Processing, Preservation and Storage

The Bachelor in Vocational program, **Food Processing, Preservation and Storage** is divided into six semester 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).Each semester has 10 papers out of which five papers are dedicated for theory and five are dedicated for practical. 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 implant training, seminar and project etc.

## 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 (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 about the trade or about technician or professional position in R & D 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 solutions 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 process food and its effects on health.
- Understand the impact of food processing technologies 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
    a. The certification levels shall lead to Diploma/Advanced Diploma/B. Voc. Degree in Food processing, preservation and storage.

## 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** |

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. 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 weight age for equivalent hours shall be 50% of that for lectures/workshops.
- For self-learning, based on e-content or otherwise, the credit weight age 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 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 theory 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.

**Scheme of examination for a paper**

| Credits | Teaching Scheme | Examination Scheme | | | |
|---|---|---|---|---|---|
| | | Theory /Practical Paper Hrs. | Average of Unit Test (2 Unit Test of 25 Marks Each) | End Semester Total Marks | Total Marks |
| 03 | 04Hrs. per week | 2.50 / 3.00 Hrs. | 25 | 50 | 75 |

**Question Paper Pattern**
***(Theory)***

| | | |
|---|---|---|
| Q.1 | Multiple Choice Question (Ten) | 10 M |
| Q.2 | Solve any Five (2 marks each) | 10 M |
| Q.3 | Solve (5 marks each) | 10 M |
| | A<br>B<br>OR<br>C<br>D | |
| Q.4 | Solve (5 marks each) | 10 M |
| | A<br>B<br>OR<br>C<br>D | |
| Q.5 | Write notes on any two.(5 marks each)<br>A<br>B<br>C<br>D | 10 M |

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**Question Paper Pattern**
***(Practical)***

| | | |
|---|---|---|
| Q 1 | Experiment | 35 |
| Q 2 | Oral | 10 |
| Q 3 | Record book | 05 |

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# Course Structure for3 years (6 Semester)

| SEMESTER - I | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Number** | **Course Title** | **Credit** | **Hours** | **Internal evaluation** | **MCQ** | **Theory** | **Total marks** |
| **General Education** | | | | | | | | |
| 1 | BVGE-1 | Introduction to Computer Hardware | 3 | 45 | 25 | 10 | 40 | 75 |
| 2 | BVGE-2 | Introduction to Computer Application | 3 | 45 | 25 | 10 | 40 | 75 |
| 3 | BVGE-3 | Practical Paper - 1 | 3 | 45 | 25 | - | 50 | 75 |
| 4 | BVGE-4 | Practical Paper - 2 | 3 | 45 | 25 | - | 50 | 75 |
| **Skill Education** | | | | | | | | |
| 5 | FPPS-111 | Principles of Food Processing | 3 | 45 | 25 | 10 | 40 | 75 |
| 6 | FPPS-112 | Food Chemistry | 3 | 45 | 25 | 10 | 40 | 75 |
| 7 | FPPS-113 | Fundamentals of Microbiology | 3 | 45 | 25 | 10 | 40 | 75 |
| 8 | FPPS-114 | Practical Paper - 3 | 3 | 45 | 25 | - | 50 | 75 |
| 9 | FPPS-115 | Practical Paper - 4 | 3 | 45 | 25 | - | 50 | 75 |
| 10 | FPPS-116 | Practical Paper - 5 | 3 | 45 | 25 | - | 50 | 75 |
| | | Total | 30 | 450 | | | | 750 |
| **SEMESTER – II** | | | | | | | | |
| **Sr. No.** | **Course Number** | **Course Title** | **Credit** | **Hours** | **Internal evaluation** | **MCQ** | **Theory** | **Total marks** |
| **General Education** | | | | | | | | |
| 1 | BVGE-5 | Computer Operating Skills | 3 | 45 | 25 | 10 | 40 | 75 |
| 2 | BVGE-6 | Communication and Documentation Skills | 3 | 45 | 25 | 10 | 40 | 75 |
| 3 | BVGE-7 | Practical Paper - 6 | 3 | 45 | 25 | - | 50 | 75 |
| 4 | BVGE-8 | Practical Paper -7 | 3 | 45 | 25 | - | 50 | 75 |
| **Skill Education** | | | | | | | | |
| 5 | FPPS-121 | Cereal Processing | 3 | 45 | 25 | 10 | 40 | 75 |
| 6 | FPPS-122 | Confectionary Technology | 3 | 45 | 25 | 10 | 40 | 75 |
| 7 | FPPS-123 | Introduction to Food Microbiology | 3 | 45 | 25 | 10 | 40 | 75 |
| 8 | FPPS-124 | Practical Paper - 8 | 3 | 45 | 25 | - | 50 | 75 |
| 9 | FPPS-125 | Practical Paper - 9 | 3 | 45 | 25 | - | 50 | 75 |
| 10 | FPPS-126 | Practical Paper - 10 | 3 | 45 | 25 | - | 50 | 75 |
| | | Total | 30 | 450 | | | | 750 |

| SEMESTER – III | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Number** | **Course Title** | **Credit** | **Hours** | **Internal evaluation** | **MCQ** | **Theory** | **Total marks** |
| **General Education** | | | | | | | | |
| 1 | BVGE-9 | Environmental Science | 3 | 45 | 25 | 10 | 40 | 75 |
| 2 | BVGE-10 | Soft Skills and Personality Development | 3 | 45 | 25 | 10 | 40 | 75 |
| 3 | BVGE-11 | Practical Paper - 11 | 3 | 45 | 25 | - | 50 | 75 |
| 4 | BVGE-12 | Practical Paper -12 | 3 | 45 | 25 | - | 50 | 75 |
| **Skill Education** | | | | | | | | |
| 5 | FPPS-231 | Legumes and Oilseeds Technology | 3 | 45 | 25 | 10 | 40 | 75 |
| 6 | FPPS-232 | Processing of Milk and Milk Products | 3 | 45 | 25 | 10 | 40 | 75 |
| 7 | FPPS-233 | Processing of Spices and Plantation Crops | 3 | 45 | 25 | 10 | 40 | 75 |
| 8 | FPPS-234 | Practical Paper - 13 | 3 | 45 | 25 | - | 50 | 75 |
| 9 | FPPS-235 | Practical Paper - 14 | 3 | 45 | 25 | - | 50 | 75 |
| 10 | FPPS-236 | Practical Paper - 15 | 3 | 45 | 25 | - | 50 | 75 |
| | | Total | 30 | 450 | | | | 750 |
| **SEMESTER – IV** | | | | | | | | |
| **Sr. No.** | **Course Number** | **Course Title** | **Credit** | **Hours** | **Internal evaluation** | **MCQ** | **Theory** | **Total marks** |
| **General Education** | | | | | | | | |
| 1 | BVGE-13 | Introduction to Entrepreneurship | 3 | 45 | 25 | 10 | 40 | 75 |
| 2 | BVGE-14 | Principles of Marketing Management | 3 | 45 | 25 | 10 | 40 | 75 |
| 3 | BVGE-15 | Practical Paper - 16 | 3 | 45 | 25 | - | 50 | 75 |
| 4 | BVGE-16 | Practical Paper - 17 | 3 | 45 | 25 | - | 50 | 75 |
| **Skill Education** | | | | | | | | |
| 5 | FPPS-241 | Meat, Poultry and Fish Technology | 3 | 45 | 25 | 10 | 40 | 75 |
| 6 | FPPS-242 | Wheat Milling and baking Technology | 3 | 45 | 25 | 10 | 40 | 75 |
| 7 | FPPS-243 | Fruit and Vegetable Processing | 3 | 45 | 25 | 10 | 40 | 75 |
| 8 | FPPS-244 | Practical Paper - 18 | 3 | 45 | 25 | - | 50 | 75 |
| 9 | FPPS-245 | Practical Paper - 19 | 3 | 45 | 25 | - | 50 | 75 |
| 10 | FPPS-246 | Practical Paper - 20 | 3 | 45 | 25 | - | 50 | 75 |
| | | Total | 30 | 450 | | | | 750 |

| SEMESTER – V | | | | | |
|---|---|---|---|---|---|
| **Sr. No.** | **Course Number** | **Course Title** | **Credit** | **Theory hours** | **Practical hours** |
| **General Education** | | | | | |
| 1 | BVGE-17 | General Education5 | 3 | 45 | 75 |
| 2 | BVGE-18 | General Education 6 | 3 | 45 | 75 |
| 3 | BVGE-19 | Lab-paper General Education 5 | 3 | 45 | 75 |
| 4 | BVGE-20 | Lab-paper General Education 6 | 3 | 45 | 75 |
| **Skill Education** | | | | | |
| 5 | FPPS-351 | Beverage Technology | 3 | 45 | 75 |
| 6 | FPPS-352 | Extrusion Technology | 3 | 45 | 75 |
| 7 | FPPS-353 | Food Storage and Logistic Management | 3 | 45 | 75 |
| 8 | FPPS-354 | Lab-Beverage Technology | 3 | 45 | 75 |
| 9 | FPPS-355 | Lab-Extrusion Technology | 3 | 45 | 75 |
| 10 | FPPS-356 | Lab-Food Storage and Logistic Management | 3 | 45 | 75 |
| | | Total | 30 | 450 | 750 |
| **SEMESTER – VI** | | | | | |
| Sr. No. | **Course Number** | **Course Title** | Duration | Marks | Credit |
| 1 | FPPS-361 | In-plant Training | 3 Months | 400 | 16 |
| | | Project work | | 200 | 08 |
| | | Seminar | | 150 | 06 |
| | | Total | | 750 | 30 |

# Semester I
## General Education

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : INTRODUCTION TO COMPUTER HARDWARE**
**CONTENTS : THEORY**
**SUBJECT CODE : BVGE-1**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Objectives:**

**1)** To make aware the students with the knowledge and use of computer hardware

2) To introduce the basic principle of hardware and operational aspects of computers hardware.

**Contents:**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit 1**<br>Definition of Computer, Features, Parts of Computer System: (Input, Output, Storage unit, ALU, CU, CPU), Hardware, Software, Data, Information processing cycle. Computer Generations, Computer languages, Compilers, Interpreters. Memory Devices (RAM, ROM & its types) | **12** | **25** |
| 2 | **Unit 2**<br>**Input Devices:** Keyboard and Mouse: The Standard Keyboard Layout, Using Mouse, Other Data Input Devices: Pen, Touch Screens, Bar Code Readers, OCR<br>**Output Devices:** CRT Monitors, Printers: Dot Matrix, Ink Jet, Laser Printers.<br>Number Systems (Binary, Octal, Hexadecimal), Computer Arithmetic (‘+’, ‘-‘, ‘*’, ‘/), Conversions (Octal to Binary, Binary to Octal, Binary to Hexadecimal, Hexadecimal to Binary). Computer codes: BCD, EBCDIC, ASCII, Unicode. | **10** | **25** |
| 3 | **Unit 3**<br>Data Processing: Factors Affecting Processing Speed, Bus, Cache Memory. RISC Processors, Ports: Standard Computer Ports, Serial and Parallel Ports Specialized Expansion Ports: SCSI, USB, FireWire, MIDI, Expansion Slots and Boards, PC Cards, Plug and Play. | **12** | **15** |

| | | | |
|---|---|---|---|
| | Secondary Storage Devices: Magnetic Tapes, Magnetic Disks, Optical Disks (Basic Principles of operation, Types, Advantages, Limitations) | | |
| 4 | **Unit 4**<br>Software: System and Application Software Operating System: Purpose of Operating Systems, Types of Operating System, Popular Operating System, Managing Hardware: Processing Interrupts, Working with Device Drivers, Utility Software, Backup Utilities, and Screen Savers. | **11** | **10** |
| | **Total** | **45** | **75** |

**Reference Books:-**


1. Computer Today- Basandara
2. Introduction to Computer and Data Processing- Pawar (Wiley-Dreamtech) 12
3. Computer Fundamentals- P.K. Sinha
4. Fundamental of computers- V. Rajaraman.
5. Introduction to Computers- Norton Peter,
6. Foundations of Computing-1st ed., BPB Publications - P. K. Sinha&PritiSinha.
7. Introduction to Computers- 4th ed., PHI- V. Raja Raman.
8. Introduction to Computers- Vikas Publishing House- Alex Leon & Mathews Leon.
9. Complete Computer Kit- Wiley Dreamtech, Delhi- Vikas Gupta,

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : INTRODUCTION TO COMPUTER APPLICATION**
**CONTENTS : THEORY**
**SUBJECT CODE : BVGE-2**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objectives:**

To acquaint the students with the knowledge and use of computers and to introduce the basic principles, organization and operational aspects of computers.

**Contents:-**

| Sr. No | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit 1: MS-WORD**<br>-File Management:<br>Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file<br>-Page Set up: Setting margins, tab setting, ruler, indenting<br>- Editing a document: Entering text, Cut, copy, paste using tool- bars<br>-Formatting a document:<br>Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods.<br>-Aligning of text in a document, justification of document, Inserting bullet sand numbering , Formatting paragraph, inserting page breaks and column breaks, Use of headers, footers: Inserting footnote, end note, use of comments, Inserting date, time, special symbols, importing graphic images, drawing tool.<br>-Tables and Borders: Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table, print preview, zoom, page set up, printing options. Using Find, Replace options, Using Tools like: Spell checker, help, use of macros, mail merge, thesaurus word | **18** | **30** |

| | | | |
|---|---|---|---|
| | content and statistics, printing envelops and labels.<br><br>-Using shapes and drawing toolbar, Working with more than one window in MS Word, How to change the version of the document from one window OS to another , Conversion between different text editors, software and MS word | | |
| 2 | **Unit 2 : MS-EXCEL-**<br>Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet<br>-Menu commands:<br>Create, format charts, organize, manage data, solving problem by analyzing data, and exchange with other applications. Programming with MS Excel, getting information while working.<br>-Work books:<br>Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays. Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet.<br>-Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data Using a list to organize data, sorting and filtering data in list<br>- Retrieve data with MS – query: Create a pivot table, customizing a pivot table. Statistical analysis of data<br>-Customize MS-Excel:<br>How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book<br>Exchange data with other application: linking and embedding, embedding Objects, linking to other applications, import, and export document. | **17** | **30** |
| 3 | **Unit 3 :**<br>**MS PowerPoint:** Creating own design, formatting objects on a slide, Use of Slide Master to control the design & formatting of a presentation, Use of Image, audio, video in the presentation, Slide show setup, slide transition, use of animation, Use of narration in presentation, Print setup & Printing handouts of a presentation. | **10** | **15** |
| | **Total** | **45** | **75** |

**Reference Books**


1. Fundamentals of Computers - E. Balagurusamy (Author) Publisher: McGraw Hill Education (India) Private Limited.
2. Ms Office 2007 in a Nutshell -S. Saxena (Author) Publisher: S.Chand (G/L) & Company Ltd.
3. Computer Fundamentals Paperback – P. K. Sinha (Author) Publisher: BPP

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRACTICAL PAPER- 1**
**CONTENTS : PRACTICAL ON INTRODUCTION TO COMPUTER HARDWARE**
**SUBJECT CODE : BVGE- 3**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Study of different parts of CPU
2. Study of SMPS
3. Identification and study of input devices
4. Identification of output devices
5. Identification of and study different parts of motherboard
6. Identification and study of different types of processors
7. Identification and study of different types of RAM
8. Study of different types of networking topology of computers
9. LAN networking
10. Setting of IP Address
11. Sharing of hard disks /printers /scanners etc.
12. Installation of Operating systems
13. Installation of MS Office
14. Installation of antivirus

**Reference Books:-**

1) Computer Today- Basandara
2) Introduction to Computer and Data Processing- Pawar (Wiley-Dreamtech)12
3) Computer Fundamentals- P.K. Sinha
4) Fundamental of computers- V. Rajaraman

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRACTICAL PAPER- 2**
**CONTENTS : PRACTICAL ON INTRODUCTION TO COMPUTER APPLICATION**
**SUBJECT CODE : BVGE-4**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. To Study Microsoft Office word
2. Use of Microsoft word for creating reports
3. Formatting of reports.
4. To Study Microsoft Excel
5. Applications of MS Excel to create payroll Sheets
6. Formatting of sheets
7. Use of Microsoft Excel for using functions
8. To Study Microsoft Power Point
9. To Study and create power point presentation
10. To Study Web and Networking
11. Visit to Industry and case study problems on computer application
12. Any other practical based on the syllabus decided by the college

**Reference Books**


1. Fundamentals of Computers - E. Balagurusamy (Author) Publisher: McGraw Hill Education (India) Private Limited
2. Ms Office 2007 in a Nutshell - S. Saxena (Author) Publisher: S.Chand (G/L) & Company Ltd
3. Computer Fundamentals Paperback – P. K. Sinha (Author) Publisher: BPP

## Skill Education

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRINCIPLES OF FOOD PROCESSING**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS-111**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective:**

To acquaint the students with fundamental principles and various techniques of food preservation.

**Learning Outcome:**

- Student will be able to understand different food preservation techniques, process.
- Student will be able to extend shelf life of different food product by using the various methods of food preservation.

**Contents**:-

| SR.No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit-I**<br>Introduction, sources of food, scope and benefit of industrial food preservation, perishable, non-perishable food, causes of food spoilage. Preservation by salt and sugar – Principle, method, equipment and effect on food quality | I5 | 15 |
| 2 | **Unit-II**<br>Thermal processing methods of preservation – Principle and equipments: Canning, blanching, pasteurization, sterilization, evaporation, etc. Need and principle of concentration, methods of concentration, Thermal concentration, freeze concentration, membrane concentration, | 12 | 10 |

| | | | |
|---|---|---|---|
| | changes in food quality by concentration | | |
| **3** | **Unit-III**<br>Food preservation by use of low temperature – principle, equipments and effect on quality, Chilling, cold storage, freezing etc. | **5** | **10** |
| **4** | **Unit-IV**<br>Preservation by drying dehydration and concentration – principle, methods, equipment and effect on quality : Difference, importance of drying and dehydration over other methods of drying and dehydration, equipments and machineries, physical and chemical changes in food during drying and dehydration. | **7** | **15** |
| **5** | **Unit-V**<br>Preservation by radiation, chemicals and preservatives: Definition, methods of irradiation, direct and indirect effect, measurement of radiation dose, dose distribution, effect on microorganisms. Deterioration of irradiated foods- physical, chemical and biological, effects on quality of foods. Preservation of foods by chemicals: antioxidants, mold inhibitors, antibodies, acidulants etc. Preservation by fermentation- Definition, advantages, disadvantages, types, equipments | **5** | **15** |
| **6** | **Unit-VI**<br>Recent methods in preservation: pulsed electric field processing, high pressure processing, Processing using ultrasound, dielectric, Ohmic and infrared heating. Theory, equipments and effect on food quality. | **11** | **10** |
| | **Total** | **45** | **75** |

**Reference Books:**

1. Food Processing and Preservation- Subbulaksmi G., and Udipi S.

2. Principles of Food Science- Vol. II- G. Borgstron, Mc. Millan Co. Ltd. London.

3. Principles of food preservation Part I& II- Owen R. Fenemma.
4. Food Science- Potter, CBS publishers.
5. Technology of Food Preservation - N.W. Desroiser and N.W. Desrosier
6. Introduction to Food Science & Technology- G.P. Stewart & M.A. Amerine
7. Food Processing Operations Vol. III -M.A. Joslyn and J.J. Heild.
8. Preservation of Fruits and Vegetables- GiridhariLal, G.S. Siddappa, and G.L.Tondon

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : FOOD CHEMISTRY**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS- 112**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objectives:**

1. To learn and understand the chemistry with respect to roles and functionality of constituents of the food.
2. To learn the importance of chemistry in food processing and preservation and storage.

**Learning Outcome:**

1. To learn and understand the chemistry of various Food micronutrient used in foods along with their role and properties

**Contents**:-

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| **1.** | **Unit-I**<br>Nature scope and development of food chemistry, role of food chemist. Moisture in foods, Role and type of water in foods, Functional properties of water, role of water in food spoilage and food safety, Water activity and sorption isotherm. | **5** | **10** |
| **2.** | **Unit-II Carbohydrates**<br>Classification and nomenclature of carbohydrates, Functional characteristics of different carbohydrates (sugar-water relationship, sweetness), Structure and function of carbohydrates: monosaccharide, oligosaccharide and polysaccharide, Browning Reactions .Enzymatic and non-enzymatic browning reaction, Millard--action, caramelization, method to control non enzymatic reaction | **10** | **15** |

| | | | |
|---|---|---|---|
| **3.** | **Unit-III Protein in Food**<br>Role of proteins in foods, Classification and structure of amino acids, essential amino acids, classification and structural organization of proteins-primary structure, secondary structure and tertiary structure, Physicochemical properties- ionic properties, protein denaturation, gelation and hydrolysis, Protein content and composition in various foods- cereal grains, legumes and oilseed proteins, proteins of meat, milk, egg and fish, | **10** | **12** |
| **4.** | **Unit-IV Lipids in food**<br>Role and use of lipids /fat, occurrence, fat group classification, Physicochemical aspects of fatty acids in natural foods, hydrolysis, reversion ,polymorphism and its application, Chemical aspects of lipolysis, auto oxidation, antioxidants, Technology of fat and oil processing- Refining, Hydrogenations, Inter esterification | **10** | **13** |
| **5.** | **Unit-V Vitamin**<br>Definition of vitamin, type of vitamin, Water soluble (Vit B-1, B-2, B-3, C) and Fat soluble (Vit A, D, E, K)- their structure and functions. | **5** | **10** |
| **6.** | **Unit-VI Enzyme**<br>General properties of enzymes, enzyme action, classification and nomenclature of enzymes, coenzymes enzyme inhibition, isozymes, Carbohydrates (Amylases, celluloses, pectinases, vertases) Proteases, Lipases and oxidases in food processing, Enzyme applications in food industry | **5** | **15** |
| | **Total** | **45** | **75** |

**Reference Books:**

1. Principles of Biochemistry, 4th edition- David L, Nelson and M.M.

Cox (2005) Maxmillan/Worth publishers/W.H. Freeman and Company- Lehninger

2. Biochemistry, 2nd edition- R.H. Garrett and C.M. Grisham (1999). Saunders college publishing N. Y. and Sons N.Y.

3. Fundamentals of Biochemistry, 2nd edition- Donald Voet, Judith G, Voet andCharlotte W. Pratt (2006), John Wiley and Sons, INC.

4. Biochemistry (2004) - J. David Rawn, Panima, Publishing Corporation, New Delhi.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : FUNDAMENTALS OF MICROBIOLOGY**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS-113**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objectives:**

To learn and understand the different food microorganisms and known different techniques used to detect microorganisms

**Learning Outcome:**

1. Student will enable to know the basics and importance of microbiology in food science

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit I:** History and Scope of Microbiology, Important contributions of various scientists, Scope of microbiology, Introduction to microorganisms - bacteria, algae, fungi, protozoa and viruses. Importance of bacteria ,yeast , and moulds in foods | 10 | 15 |
| 2 | **Unit II** : General Characteristics of Microorganisms, Structure of Prokaryotic and Eukaryotic cell, Morphology of bacteria: Size, Shape and Arrangements, Cytology of bacteria - structure & functions of cell wall, cell membrane, capsules & slime layer, flagella, Pilli, nuclear material, mesosome, ribosome and spores. | 10 | 25 |
| 3 | **Unit III** Growth curve : physical and chemical factors influencing growth and destruction microorganisms | 10 | 15 |
| 4 | **Unit IV**: Control of Microorganisms: Definitions of Sterilization, | 10 | 15 |

| | | | |
|---|---|---|---|
| | Disinfection, Antiseptic, Germicide, Microbiostasis, Antisepsis, Sanitization, Mode of action, application and advantages of: Physical agents, Chemical Agents , , Gaseous Agents | | |
| **5** | Preservation of microbial cultures | **5** | **5** |
| | **Total** | **45** | **75** |

**Reference Books:**


1. Industrial Microbiology- CBS Publisher-Prescott Dunn,

2. Microbiology fundamentals and applications- Edition, 6. Publisher, Agrobios, 2003. PurohitS.S.

3. Food Microbiology- A.S. M. press Washington-Doyle, Beuchatand Montville

4. Food Microbiology-Frazier W.C. and Westhoff D.C.1988.

5. Microbiology-Chapman& Hall, New York.

6.Essentials of the Microbiology of Foods -Mossel, D.A.A., Corry, E. L., Struijk, C. B., andBaird, R. M. 1995. John Wiley & Sons. New York,NY

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRACTICAL PAPER- 3**
**CONTENTS : PRACTICAL ON PRINCIPLES OF FOOD PROCESSING**
**SUBJECT CODE : FPPS-114**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Demonstration of various machineries used in food processing.
2. Demonstration on effect of blanching on quality of foods.
3. Demonstration on canning and bottling of fruits and vegetables.
4. Production and Preservation of food by high concentration of sugar i.e. preparation of jam/jelly
5. Production and Preservation of food by using salt e.g. Pickle
6. Production and Preservation of food by using acidulants i.e. pickling by acid, vinegar or acetic acid
7. Production and Preservation of food by using chemicals.
8. Production and Preservation of coconut shreds using humectants.
9. Drying of fruit slices in cabinet drier
10. Demonstration on drying of green leafy vegetables
11. Osmotic dehydration of foods e.g. candy
12. Production and Preservation of milk by condensation/concentration.
13. Demonstration of preserving foods under cold v/s freezing process.
14. Production and Preservation of food by fermentation (Sauerkraut, idli, tempeh, curd, dhokla etc.)
15. Visit to any food processing industry/unit.

**Reference Books:**

1. Food Processing and Preservation- Subbulaksmi G., and Udipi S.
2. Principles of Food Science, Vol. II- G. Borgstron, Mc. Millan Co. Ltd. London.
3. Principles of food preservation Part I& II- Owen R. Fenemma.
4. Food Science- Potter, CBS publishers.
5. Technology of Food Preservation - N.W. Desroiser and N.W. Desrosier

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRACTICAL PAPER- 4**
**CONTENTS : PRACTICAL ON FOOD CHEMISTRY**
**SUBJECT CODE : FPPS-115**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. To Study Safety measures in laboratory
2. To Study preparation of various Solutions
3. Determination of moisture in food sample.
4. Determination of protein in food sample.
5. Determination of ash/minerals in food sample.
6. Determination of crude fat in food sample.
7. Determination of acidity of food sample/beverages
8. Determination of pH of food samples
9. Determination of total, non-reducing and reducing sugars.
10. Determination of vitamin C content in food sample.
11. Determination of pigments in food sample.
12. Estimation of calcium.
13. Estimation of iron.
14. Estimation of zinc in food products.

**Reference Books:**

1. Lehninger: Principles of Biochemistry, 4th edition- David L, Nelson and M.M.Cox (2005) Maxmillan/Worth publishers/W.H. Freeman and Company.

2. Biochemistry, 2nd edition- R.H. Garrett and C.M. Grisham (1999). SaundersCollege publishing, N. Y. Sons.

3. Fundamentals of Biochemistry, 2nded- Donald Voet, Judith G, Voet andCharlotte W. Pratt (2006), John Wiley and Sons, INC.

4. Biochemistry (2004) - J. David Rawn, Panima, Publishing Corporation, NewDelhi.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FIRST**
**SUBJECT TITLE : PRACTICAL PAPER- 5**
**CONTENTS : PRACTICAL ON FUNDAMENTALS OF MICROBIOLOGY**
**SUBJECT CODE : FPPS-116**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Basic rules in microbiology laboratory.
2. Introduction to microbiology laboratory.
3. Study of Microscope.
4. Cleaning and Sterilization of Glass Wares.
5. Preparation of Nutrient agar Media.
6. Preparation of serial dilutions.
7. Techniques of Inoculation.
8. Staining Methods.
9. Pure Culture Techniques (Streak Plate/Pour)
10. Introduction to identification procedures.
11. Growth Characteristics of Bacteria: Determination of microbial numbers, direct plate count, generation time.
12. Factors Influencing growth, pH, temperature, growth curve for bacteria.
13. Methods of microbial culture preservation (Bacteria and yeast).

**Reference Books:**


1. Industrial Microbiology- CBS Publisher-Prescott Dunn,
2. Microbiology fundamentals and applications- Edition, 6; Publisher, Agro-bios, 2003. Purohit S.S.
3. Food Microbiology- A.S. M. press Washington-Doyle, Beuchatand Montville
4. Food Microbiology-Frazier W.C. and Westhoff D.C.1988.
5. Microbiology-Chapman& Hall, New York.
6. Essentials of the Microbiology of Foods -Mossel, D.A.A., Corry, E. L., Struijk, C. B., and Baird, R. M. 1995. JohnWiley & Sons. NewYork,NY

# II Semester

## General Education

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : COMPUTER OPERATING SKILLS**
**CONTENTS : THEORY**
**SUBJECT CODE : BVGE-5**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective**

This subject helps to understand the basics of computer operating skills

**Objective**

Student will learn about

1. the exchange of information through email
2. Modes of transmission
3. Different operating systems
4. E-commerce

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1. | **UNIT I**<br>Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog transmission, Network topologies, Network Types (LAN, WAN and MAN), OSI & TCP/IP Model, Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet | 15 | 20 |
| 2. | **UNIT II**<br>Operating System concepts, different types of Operating systems, structure of operating system, DOS/UNIX/LINUX commands, working with Windows, Windows 2007. | 10 | 15 |
| 3. | **UNIT III**<br>E-mail & Internet:<br>1. Introduction<br>2. E-mail Account & Its Functions<br>3. Search Engine | 10 | 20 |

| | | | |
|---|---|---|---|
| | 4. Surfing WebPages<br>5. Basics of Social Networking Site | | |
| 4. | **UNIT IV**<br>**E-Commerce**<br>**Introduction:** E-commerce as Business need, E-com Types, Advantages, Disadvantages, e-Commerce Architecture,<br>**Internet Payment Systems**<br>- Characteristics<br>- 4C Payment Methods<br>- SET Protocol for Credit Card Payment<br>- E-Cash, E- Check<br>- Overview of Smart Card<br>**E-Commerce security**<br>- Need of security<br>- Encryption: Public Private & Hybrid<br>- Digital Signature<br>- Authentication | 10 | 20 |
| 5. | **Total** | **45** | **75** |

**Reference Books**


1. Fundamentals of Computers - E. Balagurusamy (Author) Publisher: McGraw Hill Education (India) Private Limited
2. Ms Office 2007 in a Nutshell - S. Saxena (Author) Publisher: S.Chand (G/L) & Company Ltd
3. Computer Fundamentals Paperback – by P. K. Sinha (Author) Publisher: BPP

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : COMMUNICATION AND DOCUMENTATION SKILLS**
**CONTENTS : THEORY**
**SUBJECT CODE : BVGE-6**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective**

To enrich the students with skills to write to communicate and articulate in English (verbal as well as writing) and to acquaint the students with the knowledge and use of computers and to introduce the basic principles, organization and operational aspects of computers.

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1. | **UNIT I**<br>Introduction to Communication & Grammar : Consonant & Vowel Sounds, Indianism, Syllable & Syllable Stress, Determiners, Articles, Tense & Time, Preposition, Prepositional Phrases, Subject-Verb Agreement, Active – Passive Voice, Intonation & Modulation, Conjunctions | **15** | **15** |
| 2. | **UNIT II**<br>Formal Writing Skills: Composition Writing: Business Letters (Functions of a Business Letter, Layout of a Business Letter, Salient Features of a Business Letter, Kinds of Business Letter, Application Writing) | **15** | **15** |
| 3. | **UNIT III**<br>Conversation Skills: Nature of Conversation, Purpose of Conversation, Guidelines for Effective Conversation Skills, Proverbs used in Everyday Conversation with their Meanings/Explanations | **15** | **15** |
| 4. | **UNIT IV**<br>Documentation Skills: Introduction to Documentation: Meaning, Purpose, Need. | **15** | **15** |
| 5. | **UNIT V**<br>A short introduction to Computers, digitalized era, global connection via net, Drafting of Text, Excel, E Mails, Making Presentations, MS Word | **15** | **15** |
| | **Total** | **45** | **75** |

**Reference Books:**


1. High School English Grammar and Composition - Wren & Martin, Publisher - Churchill Livingstone
2. Anthology of English Language and Communication Skills - Sharma S R, Jacob, Mark Publications
3. Language and Communication Skills - Shastri, Rameshchandra, ABD Publications
4. A Course in Academic Writing - Renu Gupta, Orient Blackswan Publications.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : PRACTICAL PAPER- 6**
**CONTENTS : PRACTICAL ON COMPUTER OPERATING SKILLS**
**SUBJECT CODE : BVGE-7**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

**Internet and its Applications**

1. Log-in to internet
2. Navigation for information seeking on internet
3. Browsing and down loading of information from internet
4. Sending and receiving e-mail
5. Creating a message
6. Creating an address book
7. Attaching a file with e-mail message receiving a message deleting a message

**Practical**

8. Introduction to Windows
9. What is an operating system and basics of Windows?

**Practical**

The User Interface

10 Using Mouse and Moving Icons on the screen

11 The My Computer Icon

12 The Recycle Bin

13 Status Bar, Start and Menu & Menu-selection

14 Running an Application

15 Windows Explorer Viewing of File, Folders and Directories Creating and Renaming of files and folder, opening and closing of different W

**Practical**

Windows Setting Control Panels

16 Wall paper and Screen Savers

17 Setting the date and Sound

18 Concept of menu Using Help

**Practical**

Advanced Windows

19. Using right Button of the Mouse
20. Creating Short cuts
21. Basics of Window Setup
22. Notepad
23. Window Accessories

**Reference Books**


1. Fundamentals of Computers - E. Balagurusamy (Author) Publisher: McGraw Hill Education (India) Private Limited
2. Ms Office 2007 in a Nutshell - S. Saxena (Author) Publisher: S.Chand (G/L) & Company Ltd
3. Computer Fundamentals Paperback – by P. K. Sinha (Author) Publisher: BPP

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : PRACTICAL PAPER- 7**
**CONTENTS : PRACTICAL ON COMMUNICATION AND DOCUMENTATION SKILLS**
**SUBJECT CODE : BVGE-8**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Verbal & Non Verbal Communication
2. Verbal Communication - Extempore, Just a Minute, Declamation, Dialogue, Monologue
3. Non verbal Communication - Guess the Mime, Dumb Charades, Formal & Informal Writing, Facial
4. Expressions, Dressing & Clothing
5. Oral Communication - Day to today talk, formal talk, informal talk, conversation
6. Body Language
7. Right body postures, Eye Contact, Pet Fiddles, how to walk, talk and present oneself.
8. Group Discussion Skills(Meaning, Characteristic, Do's & Don'ts, Relevance, Moderating a group
9. Discussion
10. Presentation Skills - Confidence, Effective Delivery of ideas, Convincing the audience, basic courtesies
11. Public Speaking - Oration, Debates
12. English Movie Sessions
13. Documentation Skills
14. Basics of Computers, usage of short cut keys, taking out print outs, page set ups.
15. Making of Power point Presentation
16. E- Mail (Subject line, salutation, subscription, how to mark cc, drafting, sending of mails, reverts,
17. forwarding of mails, attaching pictures and documents, attaching ppts
18. Differentiation between hardware and software and practical usage of both.

19. Diagrammatic representation of pie-charts, tabular presentation of data/info, Etc

20. Basic use of MS Excel/Spread Sheets

**Reference Books:**

1. High School English Grammar and Composition - Wren & Martin, Publisher - Churchill Livingstone

2. Anthology of English Language and Communication Skills - Sharma S R, Jacob, Mark Publications

3. Language and Communication Skills - Shastri, Rameshchandra, ABD Publications

4. A Course in Academic Writing - Renu Gupta, Orient Blackswan Publications.

## Skill Education

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : CEREAL PROCESSING**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS-121**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective**

To acquaint the students with the knowledge and processing of cereal grains like Rice, Wheat, Sorghum, Bajra etc.

**Learning outcome:-**

Student will get acquainted with knowledge and processing, preservation and storage of various cereal grains and their products.

**Contents:-**

| SR.No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **UNIT-I** Present status and future prospects of cereals and millets; Morphology: Physicochemical properties; chemical composition and nutritive value | 5 | 15 |
| 2 | **UNIT-II** Rice: Paddy processing and rice milling: conventional milling, modern milling, milling operations, milling machines, milling efficiency, by-products of rice milling. Quality characteristics influencing final milled products. Parboiling: rice bran stabilization and its methods; Aging of rice; Enrichment – need, methods; processed foods from rice – breakfast cereals, flakes, puffing, canning and instant rice. | 10 | 20 |
| 3 | **UNIT-III** Wheat: break system, purification system and reduction | 10 | 15 |

| | | | |
|---|---|---|---|
| | system; extraction rate and its effect on flour composition; Quality characteristics of flour and their suitability for baking. Corn: Corn milling – dry and wet milling, starch and gluten separation, milling fractions and modified starches. Barley: Malting and milling | | |
| **4** | **UNIT-IV** Sorghum: milling, Malting, Pearling and industrial utilization Millets: Importance of Millet, composition, processing of millets for food uses, major and minor millets Products and By-product of cereal | **10** | **15** |
| **5** | **UNIT-V** Millets: infant foods from cereals and millets, breakfast cereal foods – flaked, puffed, expanded, extruded and shredded products, etc | **5** | **10** |
| | **Total** | **45** | **75** |

**Reference Books**


1. Technology of cereals - Kent
2. Hand Book of cereal science and technology- O.R. Fennema, Markus Karel
3. PHT of cereals, pulses, oilseeds- A. Chakrawarthy
4. Utilization of Rice- Luh.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : CONFECTIONARY TECHNOLOGY**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS-122**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective**

- To provide the students with the knowledge of various confectionary products with their formulations.

**Learning outcome:-**

- Students will be able to perform different confectionery products like, candies, fruit toffee, chakki, petha, toffee etc.
- Students will get knowledge of sugar and allied industries.

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit I**<br>History, Traditional confectionary goods, Types of confectionary, classification of confectionery products Raw Materials/ ingredients-Sugar, Sugar qualities, Physical, Chemical, Optical properties. Sugar grinding, Dextrose, Fructose, Lactose, caramel, maltose, Honey, sorbitol, xylitol, Iso-malt, soy maltose, Poly-dextrose, Mannitol. | 5 | 10 |
| 2 | **Unit II**<br>Whipping, Release agent, thickeners, Acidulents, Milk and Milk Products, Flavours for confectionery, emulsifiers and other additives, Starch derivatives, colours used in confectionary. Production of glucose syrup, Acid hydrolysis, enzyme hydrolysis, | 10 | 15 |
| 3 | **Unit III**<br>Cocoa Processing: Cocoa bean, processing, roasting, Fermentation, Production of Cocoa butter Cocoa powder, its | 10 | 15 |

| | | | |
|---|---|---|---|
| | quality. Chocolate Processing: Ingredients, Mixing, Refining, Conching, Tempering, Molding, Cooling, Coating, Fat bloom. | | |
| **4** | **Unit IV**<br>High Boiled Sweets: Introduction, Composition, Properties of high boiled sweets, preparation of high boiled sweets, Traditional, batch and continuous Method of preparation, Different types of higher boiled sweets, Recipes. Caramel: Definition, Composition, Factors affecting quality of caramel, caramel Manufacture process, batch type, continuous types, checking of faults in caramel, | **10** | **10** |
| **5** | **Unit V**<br>Toffee: Definition, Composition, types of toffee Ingredient and their role. Batch and Continuous method of toffee Fondant: Fudge/Creamy: ingredients, Methods, Productivity Lozenges: Definition recipe, Method of Manufacture, Compositions, factors affecting quality, Industrial production, checklist of faults and remedy | **5** | **10** |
| **6** | **Unit VI**<br>Tablets: Definitions, recipe, composition, wet granulation, Slugging, Manufacture of Tablet, and Checklist of tablet faults. Marshmallow and. Nougat: Definition, composition, recipe, and method of manufacture. Nougat | **5** | **10** |
| | **Total** | **45** | **75** |

**Reference Books;**


1. Sugar Confectionary and Chocolate Manufacture - R. Less and E.B. Jackson
2. Industrial Chocolate Manufactory and Use- S.T. Beekelt
3. Chocolate, Cocoa& Confectionary Sci. & Tech. - Bernared W. Minifie
4. Basic Baking- S.C. Dubey

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : INTRODUCTION TO FOOD MICROBIOLOGY**
**CONTENTS : THEORY**
**SUBJECT CODE : FPPS -123**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**Learning Objective**

To acquaint with different groups of micro-organisms associated with food, their activities, destruction and detection in food.

**Learning outcomes:-**

Student will get acquainted with different groups of micro-organisms associated with food and their activities in food and food products during processing, preservation and storage.

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **UNIT I:** Introduction of microbiology, History and significance of food microbiology. Classification of microbes, Structure of microbes, Metabolism of microbes. | 5 | 15 |
| 2 | **UNIT II :** Environmental microbiology: microbiology of air and water | 10 | 15 |
| 3 | **UNIT III :** Food contamination and public health: food poisoning | 10 | 15 |
| 4 | **UNIT IV:** Food microbiology and spoilage of fruits and vegetables, milk and milk products, cereals and cereal products. Industrial microbiology: Industrial application of microbes | 10 | 15 |

| | | | |
|---|---|---|---|
| **5** | **UNIT V:**<br>Thermal inactivation of microbes: pasteurization, sterilization etc. concept of TDT, F, Z and D values. Factors affecting heat resistance. Antimicrobial agents: mechanism and action | **10** | **15** |
| | **Total** | **45** | **75** |

**Reference Books:**


1. Food microbiology by V. Ramesh, MJP publishing.
2. Food microbiology by W.C. Frazier, Ist Edition by Mcgraw Hill Pub. Co. New York.
3. Modern Food Microbiology, J.M. Jay. CBS publisher.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : PRACTICAL PAPER- 8**
**CONTENTS : PRACTICAL ON CEREAL PROCESSING**
**SUBJECT CODE : FPPS-124**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's:-**

1. Determination of physical properties of cereal grains
2. Determination of chemical properties of cereal grains
3. Determination of Ash content of cereal grains
4. Determination of moisture content of cereal grains
5. Determination of crude protein content of cereals
6. Determination of fat content of cereal grain
7. Studies on cooking quality of cereals;
8. Preparation of malt;
9. Value added products from cereals and millets
10. Production of modified starch
11. Preparation of different cereal products(Puffed rice)
12. Preparation of different rice products (Idli)
13. Visit to milling industry

**Reference Books**


5. Technology of cereals - Kent
6. Hand Book of cereal science and technology- O.R. Fennema, Markus Karel
7. PHT of cereals, pulses, oilseeds- A. Chakrawarthy
8. Utilization of Rice- Luh.

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : PRACTICAL PAPER- 9**
**CONTENTS : PRACTICAL ON CONFECTIONARY TECHNOLOGY**
**SUBJECT CODE : FPPS-125**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Production of invert sugar
2. Preparation of High boiled sweets;
3. Preparation of Toffee
4. Preparation of Groundnut Chikki
5. Preparation of decorative cake
6. Preparation of Chocolate
7. Preparation of Traditional ; Indian Confection;
8. Preparation of shrikhandwadi
9. Preparation of milk chocolate
10. Preparation fruit toffee
11. Preparation of flour based confectionery
12. Preparation of milk cake
13. Preparation of petha
14. Preparation of fruit candy
15. Preparation of rasgulla
16. Visit to Confectionary Industry

**Reference Books;**


1. Sugar Confectionary and Chocolate Manufacture - R. Less and E.B. Jackson
2. Industrial Chocolate Manufactory and Use- S.T. Beekelt
3. Chocolate, Cocoa & Confectionary Sci. & Tech. - Bernared W. Minifie

   Basic Baking- S.C. Dubey

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : SECOND**
**SUBJECT TITLE : PRACTICAL PAPER- 10**
**CONTENTS : PRACTICAL ON INTRODUCTION TO FOOD MICROBIOLOGY**
**SUBJECT CODE : FPPS -126**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. An introduction to microbiology, aseptic technique and safety.
2. Preparation of culture media.
3. To sterilize the media and equipment.
4. To prepare serial dilutions.
5. Plating techniques
6. Culturing the bacteria on a solid media by using serial dilution method and determining the number of viable cells in the culture (standard plate count).
7. Introduction to microscopy and to study cell morphology with simple staining.
8. To study cell morphology and cell arrangement with negative stain.
9. To stain bacteria with gram stain.
10. To stain bacterial cells by wet-mount technique to check the mobility (flagellin) in bacterial cell.
11. To stain bacterial cells with malachite green stain to check the presence of endospore.
12. Isolation of mold from foods.
13. Microbial examination of cereal and cereal products
14. Microbial examination of fruits and vegetable products
15. Microbial examination of milk and milk products

**Reference Books:**


4. Food microbiology - V. Ramesh, MJP publishing.
5. Food microbiology - W.C. Frazier, Ist Edition by Mcgraw Hill Pub. Co. New York.
6. Modern Food Microbiology- J.M. Jay. CBS publisher.

# Syllabus II$^{nd}$ Year

***Effective from the academic year June 2019***

# 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**

- As we aware, the 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, prepared to alter their understanding as they learn new ways of understanding.

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | **Unit I**<br><br>**Multidisciplinary nature of environmental studies**<br>Definition, scope and importance, need for public awareness.<br>**Natural Resources: Renewable and non-renewable resources:**<br>Natural resources and associated problems<br>Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.<br>Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems<br>Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.<br>Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.<br>Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. | 5 | 10 |

| | | | |
|---|---|---|---|
| | vii. Role of an individual in conservation of natural resources.<br>viii. Equitable use of resources for sustainable lifestyles. | | |
| **2** | **Unit II**<br>**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.<br>Desert ecosystem d. Aquatic ecosystems(ponds, streams, lakes, rivers, oceans, estuaries) | **10** | **15** |
| **3** | **Unit III**<br>**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-sports 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. | **10** | **15** |
| **4** | **Unit IV**<br>**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. | **10** | **10** |
| **5** | **Unit V**<br>**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 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 , | **5** | **10** |

| | | | |
|---|---|---|---|
| | Wildlife Protection Act , Forest Conservation Act , Issues involved in enforcement of environmental legislation, Public awareness. | | |
| **6** | **Unit VI**<br>**Human Population and the Environment:** Population growth, variation amongnations, 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, Clanderson 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:-**

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

| | | | |
|---|---|---|---|
| | e) Appreciation<br>f) Opening, middle explanation and closing<br>g) Importance of curiosity in presentation | | |
| **4** | **Unit IV:- Communication Skill**<br>a) Enthusiasm<br>b) Pure listening and pure response<br>c) Body language<br>d) Open ended communication and close ended communication<br>e) Yes or yes technology | **10** | **10** |
| **5** | **Unit V:- Leadership and Team Management**<br>a) Definition of leader<br>b) Qualities of leader<br>c) Duties of leader<br>d) Definition of team<br>e) Importance of team<br>f) Formation of team<br>g) Management of team | **5** | **10** |
| **6** | **Unit VI:-Personality Development**<br>a) Definition of personality<br>b) External factors affecting personality<br>c) Internal factors affecting personality<br>d) Meditation<br>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. Ujwal Patani
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 PAPER- 11**
**CONTENTS : PRACTICAL ON ENVIRONMENTAL SCIENCE**
**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. Bharucha Erach, 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 PAPER-12**
**CONTENTS : PRACTICAL ON SOFT SKILLS AND PERSONALITY DEVELOPMENT**
**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**<br>Present status and future prospects of legumes and oilseeds; Morphology of legumes and oilseeds; Classification and types of legumes and oilseeds | I5 | 15 |
| 2 | **Unit-II**<br>Anti-nutritional compounds in legumes and oilseeds; Methods of removal of anti-nutritional compounds | 12 | 10 |
| 3 | **Unit-III**<br>Milling of legumes: home scale, cottage scale and modern milling methods, milling quality, efficiency and factors affecting milling; problems in dhal milling industry<br>Soaking and germination of pulses | 5 | 10 |

| | | | |
|---|---|---|---|
| **4** | **Unit-IV**<br>Cooking quality of legumes – factors affecting cooking quality | **7** | **15** |
| **5** | **Unit-V**<br>Oilseeds: composition, methods of extraction<br>Desolventization and refining of oils: degumming, neutralization bleaching, filtration, deodorization, etc.<br>New technologies in oilseed processing | **5** | **15** |
| **6** | **Unit-VI**<br>Utilization of oil seed meals for food uses i.e. high protein products like concentrate, isolates<br>By-product of pulses and oil milling and their value addition. | **11** | **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:**

3. To acquaint with techniques and technologies of testing and processing of milk into various products and by products.

**Learning Outcome:**

- Maintain hygiene and cleanliness of floor dairy equipments.
- 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**<br>Milk and milk products in India; Importance of milk processing plant in the country | 5 | 10 |
| 2 | **Unit-II**<br>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**<br>Problems of milk supply in India. UHT, toned, humanized, fortified, reconstituted and flavoured milks | 10 | 12 |

| | | | |
|---|---|---|---|
| **4** | **Unit-IV**<br>Technology of fermented milks (starter culture, dahi, yoghurt, shrikhand); Milk products processing viz. cream, butter, *ghee*, cheese, condensed milk, evaporated milk, whole and skimmed milk powder | **10** | **13** |
| **5** | **Unit-V**<br>Ice-cream, butter oil, *khoa*, *channa, paneer* and similar products<br>Judging and grading of milk products | **5** | **10** |
| **6** | **Unit-VI**<br>Insanitization *viz*. selection and use of dairy cleaner and sanitizer<br>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:**<br>Production and processing scenario of spice, flavour & plantation crops and its scope | 10 | 15 |
| 2 | **Unit II** :<br>Major spices: Post harvest technology, composition, processed products of spices – ginger, chilli, turmeric, onion, garlic, pepper, cardamom, cashew nut and coconut<br>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**<br>Tea, Coffee, Cocoa: Processing quality control<br>Vanilla and annatto-processing<br>Vanilla and annatto-processing<br>Spice oil and oleoresins | 10 | 15 |
| 4 | **Unit IV**:<br>Vanilla and annatto-processing<br>Spice oil and oleoresins | 10 | 15 |
| 5 | Standards specification of spices and flavours<br>Packaging of spices and spice products | 5 | 5 |
| | **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 PAPER-13**
**CONTENTS : PRACTICAL ON LEGUMES AND OILSEEDS TECHNOLOGY**
**SUBJECT CODE : FPPS-234**
**MARKS : 75 MARKS**
**TOTAL HRS : 45**

**List of the Practical's**

1. Determination of physical properties of legumes/oilseeds
2. Determination of antinutritional 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. Production Preparation 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 PAPER-14**
**CONTENTS : PRACTICAL ON PROCESSING OF MILK AND MILK PRODUCTS**
**SUBJECT CODE : FPPS-235**
**MARKS : 75 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 PAPER-15**
**CONTENTS : PRACTICAL ON PROCESSING OF SPICES AND PLANTATION CROPS**
**SUBJECT CODE : FPPS-236**
**MARKS : 75 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


# 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

**Contents:-**

| SR. No. | Topic name | Number of Hours | Marks |
|---|---|---|---|
| 1 | UNIT I: Introduction to Entrepreneurship<br>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)<br>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<br>Meaning and need of financial planning, sources of finance, capital structure and factors affecting on capital structure, management of working capital, short term finance for MSMEs | 10 | 20 |

| | | | |
|---|---|---|---|
| **4** | UNIT IV: Entrepreneurship Development: Recent Trends<br>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<br>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<br>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<br>Products Decision – concept, process and classification<br>Price Decision – concept, significance and factors affecting pricing decisions.<br>Physical Distribution – concept, importance and function of distribution decisions | **10** | **20** |

| | | | |
|---|---|---|---|
| | Promotion Decision – concept of sales promotion, importance of sales promotion, system of sales promotion. | | |
| **4** | **UNIT IV:** Recent Trends in Marketing and Advertisements<br>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 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

**COURSE NAME : B.VOC. IN FOOD PROCESSING, PRESERVATION AND STORAGE**
**SEMESTER : FOURTH**
**SUBJECT TITLE : PRACTICAL PAPER- 16**
**CONTENTS : PRACTICAL ON INTRODUCTION TO INTREPRENEURSHIP**
**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 PAPER- 17**
**CONTENTS : PRACTICAL ON MARKETING MANAGEMENT**
**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**<br>Wheat – importance, production verities used for cultivation<br>Types of wheat, grading and quality of wheat | 5 | 15 |
| 2 | **UNIT-II**<br>Structure of wheat, chemical constituents and their distribution<br>Physico-chemical and Rheological properties<br>Enzymes in wheat, damage of wheat<br>Conditioning of wheat – principles and methods of conditioning | 10 | 20 |
| 3 | **UNIT-III**<br>Milling of wheat: Rolling flour milling process; break rolls; reduction rolls; Design and operation, wheat milling process<br>Products of wheat milling industry: Flour, atta, etc. flour grades, supplementation, Fortification<br>Flour additives, flour improvers, Bleaching, Oxidizing agents | 10 | 15 |

| | | | |
|---|---|---|---|
| **4** | **UNIT-IV**<br>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.<br>Baked product from soft wheat; cookies, crackers, biscuits, cakes – ingredients, process, fault causes and remedy | **10** | **15** |
| **5** | **UNIT-V**<br>Other bakery products: using very hard wheat. Pizza, pastry and its types. Macaroni products: Including spaghetti, noodles, and vermicelli-process.<br>Nutritional improvement of bakery products<br>Setting of bakery unit, bakery norms, specifications for raw materials<br>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, POULRY 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**<br>Sources and developments of meat and poultry industries in India and importance in national economy<br>Muscle structure, chemical composition and physico-chemical properties of meat muscle. Abattoir design and layout | 5 | 10 |
| 2 | **Unit II**<br>Pre-slaughter transport and care and antimortem inspection<br>Slaughtering of animals and poultry, post-mortem inspection and grading of meat<br>Factors affecting post-mortem changes, properties and shelf life of meat | 10 | 15 |
| 3 | **Unit III**<br>Egg structure: Composition, quality characteristics, processing and preservation of eggs<br>Processing and preservation of meat- mechanical deboning, aging or chilling, freezing, pickling, curing, cooking and smoking of meat | 10 | 15 |
| 4 | **Unit IV**<br>Meat tenderization. – principles an methods | 10 | 10 |

| | | | |
|---|---|---|---|
| | Traditional, batch and continuous Method of preparation, Technology of manufacture of meat and poultry products | | |
| **5** | Unit V<br>Meat plant sanitation and safety; By-products utilization of abattoir | **5** | **10** |
| **6** | Unit VI<br>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 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 : 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 equipments & 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:**<br>Production and processing scenario of fruits and vegetables in India and World<br>Scope of fruit and vegetable preservation industry in India. present status, constraints and prospects | 5 | 15 |
| 2 | **UNIT II :**<br>Overview of principles and preservation methods of fruits and vegetables<br>Commercial processing technology of fruits and vegetables<br>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 :**<br>Minimal processing of fruits and vegetables<br>Blanching operations and equipment | 10 | 15 |

| | | | |
|---|---|---|---|
| **4** | **UNIT IV:**<br>Canning: Definition, processing steps, and equipment, cans and containers, quality assurance and defects in canned products<br>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:**<br>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<br>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 PAPER- 18**
**CONTENTS : PRACTICAL ON WHEAT MILLING AND BAKING TECHNOLOGY**
**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 PAPER- 19**
**CONTENTS : PRACTICAL ON MEAT, POULRY AND FISH TECHNOLOGY**
**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 PAPER- 20**
**CONTENTS : PRACTICAL ON FRUITS AND VEGETABLES PROCESSING**
**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.