UNIVERSITY OF KERALA

SYLLABUS

for

B. Voc. Degree Programme

In

FOOD PROCESSING AND MANAGEMENT

UNDER

Choice based Credit and Semester system

(w.e.f. 2019 admission)
The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc. program is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India’s economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge. The proposed vocational program in Food Processing and Management will be a judicious mix of skills, professional education related to Food Processing and Management and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Food Processing and Management.

1. **ELIGIBILITY FOR ADMISSION**

   Eligibility for admissions and reservation of seats for B.Voc Food Processing and Management shall be according to the rules framed by the University from time to time. No student shall be eligible for admission to B.Voc. Food Processing and Management unless he/she has passed the Plus Two of the Higher Secondary Board of Kerala or that of any other university or Board of Examinations in any state recognized as equivalent to the Plus Two of the Higher Secondary Board in Kerala, with not less than 45% marks in aggregate. However SC/ST, OBC, and other eligible commModuleies shall be given relaxation as per University rules.

2. **NATURE OF THE COURSE**

   This course follows 2(b) pattern of the University under first degree CBCS program with appropriate modifications.

   - No open course is envisaged
   - No Electives are included
   - Total credits enhanced to 180 instead of 120
   - Working hours per week is increased to 30 hours
   - All vocational subjects are treated as core course.
   - Multiple exit points are permitted, that is, if willing, candidate can quit after the successful completion of first & second year. Candidate do so, can’t be re-entered.
➢ There will not be provisions for improvement.

➢ A candidate who failed in a semester may get two supplementary chances. Only failed papers are to be written in the supplementary examination.

3. CURRICULUM

The curriculum in each of the years of the program would be a suitable mix of general education and skill development components.

4. DURATION

The duration of the B.Voc Food Processing and Management shall be three years consisting of six semesters. The duration of each semester shall be five months inclusive of the days of examinations. There shall be at least 90 working days in a semester

PROGRAM STRUCTURE

The B.Voc Food Processing and Management shall include:

➢ Language courses (English)
➢ General Education Components
➢ Skill Components
➢ Project
➢ Industrial Training
➢ Soft Skills and Personality Development Programs
➢ Study tours

<table>
<thead>
<tr>
<th>Duration /NSQF Qualification Levels</th>
<th>Total Credit</th>
<th>Semester</th>
<th>Exit point Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year / Level 5</td>
<td>60</td>
<td>Two semester</td>
<td>Diploma</td>
</tr>
<tr>
<td>2nd year / Level 6</td>
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<td>Four Semester</td>
<td>Advanced Diploma</td>
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<tr>
<td>3rd year / Level 7</td>
<td>60</td>
<td>Six Semester</td>
<td>B VOC</td>
</tr>
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</table>
Evaluation

The evaluation of each course shall contain two parts - Sessional Assessment and Final Assessment. The Sessional and Final Assessment shall be made using a Mark-Based Grading System on a 7-point scale. Overall Sessional: Final ratio will be maintained as 20:80.

Theory Examinations

a. Sessional

The sessional evaluation is to be done by continuous assessment of the following components. The components of the evaluation for theory and practical and their weights are as below.

I. Distribution of Sessional marks:

a. Theory courses

<table>
<thead>
<tr>
<th>Components</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
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</tr>
<tr>
<td>Assignment/seminar Viva</td>
<td>5</td>
</tr>
<tr>
<td>Test Paper</td>
<td>10</td>
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<td>Total</td>
<td>20</td>
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b. Practical courses

<table>
<thead>
<tr>
<th>Components</th>
<th>Marks</th>
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<tr>
<td>Attendance</td>
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<td>Lab involvement</td>
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<td>Total</td>
<td>20</td>
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</table>

II. Attendance Evaluation

A student should have a minimum of 75% attendance. Those who do not have the minimum requirement for attendance will not be allowed to appear for the Final Examinations.

Distribution of Marks for evaluation

Components Marks
III. Assignment/Seminar/Viva

Each student has to take one assignment or one seminar presentation per course from first to fifth semester. The students should compulsory take one seminar presentation on sixth semester.

**Different components for the evaluation of Assignment**

<table>
<thead>
<tr>
<th>Components</th>
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<tbody>
<tr>
<td>Punctuality</td>
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<tr>
<td>Content</td>
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<tr>
<td>Conclusion</td>
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</tr>
<tr>
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**Different components for the evaluation of Seminar**

<table>
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<tbody>
<tr>
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<tr>
<td><strong>Total</strong></td>
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</tr>
</tbody>
</table>

IV. Test Paper

Model examination mark is considered.

b. Final

The final examination of all semesters shall be conducted by the University of Kerala on the close of each semester. For reappearance/ improvement, students may appear along with the next batch.

**Theory Examinations**
A question paper shall be a judicious mix of very short answer type, short answer type, short essay type / problem solving type and long essay type questions. Courses such as common courses, open course and elective course do not contain practical courses. The pattern of questions for these courses without practical are listed below.

1. Each question paper has four parts A, B, C & D.
2. **Part A** contains 10 questions of 1 mark each all of which the candidate has to answer.
3. **Part B** contains 12 short answer type questions spanning the entire syllabus and the candidate has to answer 8 questions. Each question carries 2 marks.
4. **Part C** contains 9 problem type questions / short essays spanning the entire syllabus and the candidate has to answer 6 questions. Each question carries 4 marks. But, for open courses, Part C contains short essay type questions only.
5. **Part D** contains 4 essay type questions spanning the entire syllabus and the candidate has to answer 2 questions. Each question carries 15 marks.
6. The total marks for courses are 80.

**Practical Examinations**
The practical examinations for the core and complementary courses are to be conducted at the end of every semester by the institution. The external examiner shall be selected by the institution. The score sheet should be sent to the Controller of Examinations soon after the evaluation. A minimum of 16 experiments should be done in a practical course and a candidate submitting a certified record with a minimum of 8 experiments alone is eligible for appearing for the Practical Examination.

**Practical Evaluation**
The scheme of evaluation of the practical examination will be decided by the Board of Examiners.

**Student strength for practical examination**
There shall be at least one teacher to supervise a batch of not more than 15 students in each laboratory session.

**Internship/Project Evaluation**
The evaluation of the internship at various Food Processing Industries will be assessed by the internal coordinator and faculty.

All students have to begin working on the project in the sixth semester and must submit at the end of the semester. The ratio of Sessional to Final component of the project is 2:3. The mark distribution for assessment of the various components is as follows.
### Sessional Evaluation of Project (Sem 4)

<table>
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<td>Review I</td>
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<td>Review II</td>
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<td>Viva</td>
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### External Evaluation of Project (Sem 4)

<table>
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<tr>
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<tr>
<td>Review of Literature</td>
<td>5</td>
</tr>
<tr>
<td>Materials &amp; Methods</td>
<td>5</td>
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<td>Results &amp; Discussion / Applications</td>
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<td>Report</td>
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<td>Viva- voce/presentation</td>
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### Sessional Evaluation of Project (sem6)

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<td>Viva/Presentation</td>
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### External Evaluation of Project (sem6)

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<td>Report</td>
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<td>Viva- voce/presentation</td>
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<td>Principles of Food Preservation</td>
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</table>

**Notes:**
- S: Seminar
- G: General Contact Hours
- CE: Course Examination
- ECE: End Semester Examination
Semester I

Code: EN 1111.1 - LISTENING AND SPEAKING SKILLS IN ENGLISH
(General)

Total Credits: 4
No. of instructional hours: 4 hrs/week

AIMS
1. To familiarize students with English sounds and phonemic symbols.
2. To enhance their ability in listening and speaking.

OBJECTIVES
On completion of the course, the students should be able to
1. Listen to lectures, public announcements and news on TV and radio.
2. Engage in telephonic conversation.
3. Communicate effectively and accurately in English.
4. Use spoken language for various purposes.

COURSE OUTLINE

Module 2: Listening Skills: Difference between listening and hearing – active listening – barriers to listening – academic listening - listening for details - listening and note-taking - listening for sound contents of videos - listening to talks and descriptions - listening for meaning - listening to announcements - listening to news programs.


Module 4: Dialogue Practice (Students should be given ample practice in dialogue, using core and supplementary materials.)

COURSE MATERIAL
Core reading:

Further reading:

Reference:

Core reading:

The following One-act plays prescribed:
1). Serafin and Joaquin Alvarez Quinters - A Sunny Morning
2). H.H. Munro - The Death Trap
3). Vincent Godefroy - Fail Not Our Feast

Semester I

VFP1S01 – BAKERY AND CONFECTIONERY TECHNOLOGY

(Skill Course)

Total Credits: 5

No. of instructional hours: 5 hrs/Week

Aim of the course: To impart basic and applied technology of baking and confectionery and acquaint with the manufacturing technology of bakery and confectionary products.

Course Overview and Context

- To highlight the processing methods used in baking and confectionery industries.
- To know about the various types of food products made using baking technology.
- To have a basic idea about baking and confectionery manufacture and quality control.
- To know about the importance of each ingredient in the bakery and how it effects the overall product and its sensory and quality parameters.
- To be able to start a small scale bakery and confectionery

Module I: Manufacture of Sugar

Sugarcane, jaggery, khandasari sugar, raw sugar, refined sugar, white sugar, beet sugar, manufacture of sugar from sugar cane, refining of sugar.

Module II: Classification of confectionery

Sugar boiled confectionery- crystalline and amorphous confectionery, rock candy, hard
candy, lemon drop, china balls, soft candy, lollipops, marshmallows, fudge, cream, caramel, toffee, lozenges, gumdrops, honeycomb candy.

Module III: Properties of wheat

Wheat – Properties, Quality – Hardness, Gluten strength, protein content, soundness. Methodology and approaches to evaluate bread and bread – wheat quality – processing factors, product factors.

Module IV: Principles of baking and Bread manufacturing

Major baking ingredients and their functions, role of baking ingredients in improving the quality of bread. Characteristics of good flour used for making bread, biscuits and cakes. Ingredients used for bread manufacture, methods of mixing the ingredients, dough development methods - straight dough, sponge dough, moulding, proofing, baking, packing, spoilage, bread staling, methods to reduce bread staling and spoilage.

Module V: Cake and Biscuit manufacturing

Processing of cakes and biscuits- ingredients, development of batter, baking and packing, Spoilage in cakes and biscuits.

Learning Resources

Reference books:


Semester I

VFP1S02 – PRINCIPLES OF FOOD PRESERVATION
(Skill Course)

Total Credits: 4 No. of instructional Hours : 4 Hours/week

Aim of the course: To make students understand about the mechanism of spoilage and deterioration in foods, the basic food preservation principles, and methods to preserve foods.

Course Overview and Context

- To study the different ways in which food spoilage occurs and the techniques to prevent it.
- To know the different spoilage agents and the ways in which they act on food.
• To understand the principles behind the various methods of food preservation.
• To know how to use these principles to preserve different types of foods.
• To study the method of action of different preservatives.

**Syllabus Content**

**Module I: Food Spoilage**
Definition, types of spoilage - physical, enzymatic, chemical and biological spoilage. Mechanism of spoilage and its end products, shelf life determination.

**Module II: Preservation by using Preservatives**
Food preservation: Definition, principles, importance of food preservation, traditional and modern methods of food preservation. Food additives – definition, types, Class I and Class II preservatives.

**Module III: Preservation by use of high temperature**
Pasteurization: Definition, types, Sterilization, Canning - history and steps involved, spoilage encountered in canned foods, types of containers used for canning foods. Food irradiation – Principles, merits and demerits, effects of irradiation and photochemical methods.

**Module IV: Preservation by use of Low Temperature**
Refrigeration - advantages and disadvantages, freezing: Types of freezing, common spoilages occurring during freezing, difference between refrigeration and freezing.

**Module V: Preservation by Removal of Moisture**
Drying and dehydration - merits and demerits, factors affecting, different types of drying, Concentration: principles and types of concentrated foods.

**Learning Resources**

**Reference Books**
Semester- 1
VFP1SO3 - FUNDAMENTALS OF FOOD SCIENCE
(Skill Course)

Credit : 4
No. of instructional hours: 4 hrs/week

Objectives :To enable students to -

1) Understand the basic concept, functions, and classification of food.

2) Familiar with different methods of cooking.

Course content :

Module I  Introduction to food science
• Concept of food, food science
• Objectives of food science
• Functions of food

Module – II  Classification of food
• According to food science
• Basic five food groups
• Selection of food

Module – III  Methods of cooking
• Traditional cooking methods
• Modern cooking methods
• Objectives and importance of cooking

Module – IV  Food Preparation and storage
• Basic terms used in food preparation
• Pre-preparation for cooking

PRACTICALS
• Introduction to laboratory rules
• Equipments used in cooking
• Terms used in cooking.
• Weights and Measures of raw and cooked food
Methods of cooking

1. Traditional preparation of the any two methods of the following
   a) Boiling
   b) Roasting
   c) Frying
   d) Steaming

2. Modern methods - Preparation of any two recipes from the following
   a) Baking
   b) Solar
   c) Microwave
   d) Combination

References:

Semester I
VFP1S04 - BAKERY AND CONFECTIONERY TECHNOLOGY (Practical)
(Skill Course)

Total Credits: 3  No. of instructional hours: 3 hrs/week

Aim of the course: To develop professional and practical knowledge in bakery and confectionary and make them competent as an entrepreneur.

Course Overview and Context

- To improve the culinary skills of the students
- To gain knowledge about the preparation of some basic food products
- To use the processes studied in food chemistry and food preservation papers to prepare different food products
- To understand how these can be utilized to start a small scale processing Module.
- It involves not only gaining knowledge on how to make a food product but also studies the principles behind them.
- It helps the students to gain not only theoretical but also practical knowledge

Syllabus Content
1. Preparation of ghee biscuits
2. Preparation of melting marvels
3. Preparation of sweet and salt biscuits
4. Preparation of bread
5. Preparation of pizza
6. Preparation of hot cross buns (sweet buns)
7. Preparation of jam nut cookies
8. Preparation of vanilla cake
10. Visit to production Module of a bakery.

Semester I

VFP1G05 - FOOD SCIENCE AND NUTRITION I
(General Course)

Total Credits: 4  No. of instructional hours: 4 hrs/week

Aim of the course: To understand the nutrient composition of foods, their functions, sources and to impart knowledge of concept of good health and its importance.

Course Overview and Context

- To know and understand the functions, importance of all nutrients present in foods.
- To know about the various types of nutrients and their functions in the body.
- To familiarize with the recent advances in field of nutrition
- To understand the different types of newly developed food products.

Syllabus Content

Module I: Introduction to Nutrition


Module II: Food and water


Module III: Vitamins
Classification, structure, function, sources, general causes for loss in foods, bioavailability, enrichment, fortification and restoration. Modules of measurement. Deficiency and toxicity disorders.

**Module IV: Minerals**

Classification of minerals. Functions, sources, bioavailability and deficiency of the following minerals - Calcium, Iron, Iodine, Fluorine, Sodium, Potassium.

**Module V: Energy**

Modules of energy, food as a source of energy, basal metabolic rate, factors effecting BMR, total energy Requirement.

**Learning Resources**

**Reference Books**


**Semester I**

**VFP1G06- ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT**

(General Course)

**Total Credits: 4**

**No. of instructional hours: 4 hrs/week**

**Aim of the course:** To develop Entrepreneurial culture and encourage the students to become entrepreneurs.

**Course Overview and Context**

- To know about the various procedures for starting a small scale Module of production.
- To have a basic idea about how to prepare a project to start a small scale industry.
- To know about various agencies that can provide assistance for starting a new project.
Syllabus Content

Module I: Introduction to Entrepreneurship
Meaning, definition and concepts, characteristics, functions, entrepreneurial traits and motivation, role of entrepreneur in economic development, factors affecting entrepreneurial growth. Types of entrepreneurs - Entrepreneurship, Women entrepreneurship, significance, problems, solutions to the problems

Module II: Entrepreneurship Development Program
Objectives, Steps, Need for training- target group- Contents of the training program-Special Agencies for Entrepreneurial Development and Training-DIC.

Module III: Project

Module IV: Setting up of micro small and medium enterprises
Setting up of micro small and medium enterprises, location significance, Green channel, Bridge capital, Seed capital assistance, Margin money scheme, Sickness, Causes- Remedies.

Module V: Role of institutions/schemes in entrepreneurial development
SIDCO, SIDBI, NIESBUD, EDII, SISI, NREG Scheme- SWARNA JAYANTHI, Rozgar Yojana Schemes

Learning Resources

Reference Books

Semester -I
VFP1101- Industrial visit /study tour /Internship Report

Credit: 2 Total Hours: 36

Assessment of Project / Industrial visit /study tour /Internship Report
i) The Project/Industrial visit/study tour/Internship report must be submitted by the prescribed date.

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

iii) The Project/Industrial visit/study tour/Internship report and its presentation shall be evaluated by the internal coordinator of the course and concerned faculty
<table>
<thead>
<tr>
<th>Semester</th>
<th>Title of the course</th>
<th>Course code</th>
<th>No. of Hours/Week</th>
<th>Total Credits</th>
<th>Total hours/semester</th>
<th>University exam duration (in hrs)</th>
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<td>Dairy Technology</td>
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<td>Packaging Technology</td>
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</table>
AIMS:
To create better understanding about the deteriorating condition of our environment among students

OBJECTIVES
On completion this course, student should:

- Have better awareness and concern about current environmental issues
- Develop a healthy respect and sensitivity to environment
- Develop pride in social and environmental activism.

COURSE OUTLINE
Module-I: The Multi-disciplinary Nature of Environmental Studies: Definition, scope and importance, Need for Public Awareness, Ecology and Ecosystems: Definition of Ecology, Structure and function of an ecosystem, Producers, Consumers and Decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristics features and function of – forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem(ponds, streams, lakes, rivers, oceans, estuaries)

Module-II: Biodiversity and its conservation: Introduction, genetic, species and ecosystem diversity definition, value of biodiversity, biodiversity at global, national and local levels, India as a mega diversity nation, hot spots of biodiversity, threats to biodiversity – habitat lose, poaching of wild life, man wild life conflicts, endangered and endemic species of India, conservation of bio diversity in in-situ EX-situ

Module-III Natural Resources: Air resources-features, composition, structure, air quality management, forest resources-, water resources, mineral resources, food resources, energy resources, land resources, Environmental pollution: definition, air pollution, water pollution, marine pollution, thermal pollution, soil pollution, noise pollution, nuclear hazards, waste management, cleaner technologies, reuse and recycling, solid waste management, role of
individuals to prevent pollution, pollution case studies, disaster management – floods, earthquake, cyclone and landslides

Module –IV: Social issues and the environment: From unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management, resettlement and rehabilitation of people- it’s problems and concerns, case studies, environmental ethics- environmental value relation ships, environmental ethics and species preservation, climate change, global warming, acid rain, Ozone layer depletion, nuclear accidents and holocaust, case studies, waste land reclamation, consumerism and waste products, legislation to protect the environment, environmental protection act, dir(prevention and control of pollution) act, water(prevention and control of pollution) act, wild life protection act, forest conservation act, environmental management systems(EMS), environmental information systems(EIS), P.I.L public hearing and role of NGOS, ISO 9000 and 14000, issues involved in enforcement of environment legislation, public awareness, environmental economics-environment and standard of living

COURSE MATERIAL
1) Kiran B Chokkas and others : “Understanding Environment”, Sage 2004
2) P. VenugopalaRao, Environmental Science & Engineering, PHI
3) Benny Joseph: Environmental Studies, Tata McGraw Hill
4) Lester R Brown, Plan B: rescuing a Planet under stress and a civilization in trouble, 5) Orient Longman Kurien Joseph & R Nagendran, Essentials of Environmental Studies, Pearson 26

Semester II
VFP2S01 - Dairy Technology
(Skill Course)

Total Credits: 4 No. of instructional hours: 4 hrs/week

Aim of the course: To inculcate the knowledge regarding various dairy products and its processing techniques.

Course Overview and Context

• To understand about the products that can be made from milk.
• To understand the processing and storage of dairy products.
• To know about the quality control measures applied in dairy industries.
• To have a basic idea about their processing and products which can be made at a
Syllabus Content

Module I: Introduction
Milk - Definition, sources, and composition of milk, factors effecting composition of milk, physiochemical properties of milk, grading of milk-definition and types of grades, collection and transportation of milk.

Module II: Processing of market milk
Flowchart of milk processing, Reception, Different types of cooling systems. Clarification and filtration process, standardization- Pearson’s square method, pasteurization-LTTLT, HTST and UHT process- continuous pasteurizer, Sterilization and Homogenization, Cream separation- centrifugal cream separator ,bactofugation.

Module III: Special milks
Skim milk, evaporated milk, condensed milk, standardized milk, toned milk, double toned milk, flavored milk, reconstituted milk.

Module IV: Indigenous and Fermented milk products

Module V: In-Plant cleaning system
10 Hours Introduction to Cleaning in- place (CIP) system - cleaning procedure, Cleaning efficiency, Methods of cleaning in food industry, cleaning solutions – Detergents, Sanitizers. SIP system of dairy plant, Personal hygiene in dairy plant.

Learning Resources References


Aim of the course: To provide knowledge about trends and development in food packaging technologies and materials.

Course Overview and Context

- To familiarize with the different materials and methods used for packaging.
- To understand the technology behind packaging and packaging materials
- To have a basic idea about the materials used for food packaging and their testing.
- To know about the different forms in which a food can be packed

Syllabus Content

Module I: Introduction to packaging
Definition, Functions of packaging – Containment, Protection, Preservation, Promotion, Convenience, Communication. Requirements of effective package, Types of food packaging- primary, secondary and tertiary packaging.

Module II: Deteriorative Reactions and shelf life of foods
Introduction, deteriorative Reactions in food- factors affecting deterioration of food- physical changes, biological changes, chemical changes. Shelf life of foods – Definition, intrinsic and extrinsic factors controlling the rate of reactions. Shelf life determination tests.

Module III: Packaging Materials and their properties

Module IV: Special Packaging
Aseptic packaging, Active packaging, Intelligent packaging, Modified atmospheric
Packaging and controlled atmospheric packaging, Shrink packaging, stretch packaging, Biodegradable packaging, Edible packaging, Tetra packs.

**Module V: Labeling and safety concerns in food pack**

Printing process, inks, adhesives, labeling, coding- bar codes, Food packaging closures of glass and plastic containers, Legislative and safety aspects of food packaging, Machineries used in Food Packaging, Package testing-Thickness – Paper density - Basis weight – Grammage - Tensile Strength - Gas Transmission Rate (GTR) - Water Vapour Transmission Rate (WVTR).

**Learning Resources**

**References**


**Semester II**

**VFP2S03 - Dairy Technology**

(Practical) (skill course)

**Total Credits: 4**

**No. of instructional hours: 4 hrs/week**

**Aim of the course**: To develop the skills in dairy product preparation and to familiarize with the dairy plant equipments.

**Course Overview and Context**

- To gain knowledge about preparation of some dairy products
- To perform chemical analysis of milk sample
- To understand different processing equipment in dairy plant

**Syllabus Content**

2. Determination of Activity (Titrable Acidity) of Milk.
3. Determination of fat and SNF content in milk.
4. Clot on boiling test for milk.
5. Determination of specific gravity of milk.
6. Detection of Addition of Starch in Milk.
7. Preparation of Lassi.
8. Preparation of khoa.
11. Preparation of kalakand.
12. Preparation of cooking butter.
13. Preparation of ghee.
15. Visit to milk product development centre.

Semester II
EN 1211-WRITING AND PRESENTATION SKILLS
(General Course)

Credit: 4
No. of Working Hours: 4hrs/week

AIMS
1. To familiarize students with different modes of general and academic writing.
2. To help them master writing techniques to meet academic and professional needs.
3. To introduce them to the basics of academic presentation
4. To sharpen their accuracy in writing.

OBJECTIVES
On completion of the course, the students should be able to
1. Understand the mechanism of general and academic writing.
2. Recognize the different modes of writing.
3. Improve their reference skills, take notes, refer and document data and materials.
4. Prepare and present seminar papers and project reports effectively.

COURSE OUTLINE
Module 1 Writing as a skill – its importance – mechanism of writing – words and sentences - paragraph as a Module of structuring a whole text – combining different sources – functional use of writing – personal, academic and business writing – creative use of writing.

Module 2 Writing process - planning a text – finding materials - drafting – revising – editing - finalizing the draft - computer as an aid – key board skills - word processing - desk top publishing.

Module 4 Presentation as a skill - elements of presentation strategies – audience – objectives – medium – key ideas -structuring the material - organizing content - audio-visual aids – handouts - use of power point - clarity of presentation - non-verbal communication - seminar paper presentation and discussion.

COURSE MATERIAL

Semester-II
VFP2S04- FOOD PRESERVATION II
Practical (Skill Course)

Total Credits : 4 No. of instructional Hours : 4 hrs/ per week

Objectives:
To enable student –
1) To acquire knowledge of food preservation and preservation technique.
2) To know the application of food preservation methods.

Course content:
Module I - Preservation by Low Temperature
- Concept, History
- Types of preservation methods by low temperature
- Different equipments used for preservation by low temperature
- Treatments prior to freezing

Module – II - Preservation by using Preservatives
- Definition and Concept
- Types of preservatives-Natural and Artificial
- Mode of action of different preservatives
Module – III - Preservation by Irradiation Process
- Meaning and Concept
- Irradiation methods
- Sources of radiation
- Level of dose and their effect on food

Module – IV - Modern Techniques in Food Preservation
- Use of pulsed electric field
- High hydrostatic Pressure
- Hurdle technology

Reference:
3) McWillims and Paine : Modern Food Preservation, Surjeet Publication.
5) NPCS Board, Modern Technology on Food Preservation
6) SivasankarB.: Food Processing and Preservation

PRACTICALS
1) Introduction to freezing equipments
2) Preservation by using chemical preservatives
   i) Tomato ketchup
   ii) Fruit squash
3) Preparation of product by using salt as preservative
4) Preparation of product by using sugar as preservative
5) Preparation of product by using oil as preservative
6) Preparation of food product by Freeze drying to food preservation Module
7) Visit
Semester- II
VFP2G05- BUSINESS COMMUNICATION-I
(General Course)

Credit: 4 No. of instructional hours: 4hrs/week

Module 1: Use of English in Business Environment
Topics:
Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations
What is a sentence? Elements of sentence, Types of sentence: Simple, compound, complex

Module 2: Writing a Letter of Application and CV/ Resume
Topics:
Structure of a letter of application for various posts - CV/ Resume and its essentials

Module 3: Presenting Information/Data
Topics:
Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Module 4: Interview Technique
Topics:
Dos and don’ts of an interview
Preparing for an interview
Presenting documents
Language used in an interview

Practical: Based on the theory Modules

Reference Books:
2) Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student

Semester- II

VFP2I02- Industrial visit /study tour /Internship Report

Credit: 2  Total hours:36
Assessment of Project / Industrial visit /study tour /Internship Report

i) The Project/Industrial visit/study tour/Internship report must be submitted by the prescribed date.

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

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

The external evaluation of the Project / Industrial visit /study tour /Internship report will done along with practical.
## Semester III

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Semester- III
VFP3G01- APPLIED MICROBIOLOGY
(General Course)

Total Credits: 3
No. of instructional Hours : 3 hrs/week

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

Course Content:
UNIT I - Introduction to microbiology - Concept of general Microbiology - Morphological characteristics and reproduction of bacteria, yeasts, fungi. - Physical & Chemical factors affecting growth and destruction of microorganisms.
Unit II - Food Contamination - Introduction of sources of contamination. - Classification of food according to ease which it spoils. (fresh, dry and preserved) - Bacterial & viral food intoxications. - Naturally occurring toxicants in food, toxic metals & chemicals
Unit III - Spoilage of Food - Introduction of microbial spoilage - Cereals & cereal products spoilage - Milk & milk products spoilage - Fruit & Vegetable products spoilage - Meat, poultry egg & fish products spoilage
Unit IV Food Born Disease - Introduction of food born disease - Mode of transmission of disease - Food borne illness - Control of food borne illness

References
2) James M. Jay 1927. 6th edition, Modern Food Microbiology
3) G.J. Banwart, Basic Food Microbiology
4) Singh B.D., Nallari P., Kavikishore P and Singh R.P Applied Microbiology
Semester III

VFP3S02 - TECHNOLOGY OF FISH, MEAT AND EGG PROCESSING
(Skill Course)

Total Credits: 4  No. of instructional Hours : 4 hrs/week

Aim of the course: To understand the technology for handling, processing, preservation of meat, poultry and fish products.

Course Overview and Context

- To understand need and importance of livestock, egg and poultry industry
- To study structure, composition and nutritional quality of animal products.
- To study processing and preservation of animal foods.
- To understand technology behind preparation of various animal food products and by product utilization

Syllabus Content

Module I: Compositional and Nutritional aspect of Animal foods

Fish - Classification of fish (fresh water and marine), composition, spoilage of fish - microbiological, physiological, biochemical. Meat - Definition of carcass, concept of red meat and white meat, composition of meat, marbling in meat, post mortem changes in meat - rigor mortis, tenderization of meat, ageing of meat. Egg - composition and nutritive value, egg proteins, characteristics of fresh egg, deterioration of egg quality.

Module II: Fish Processing


Module III: Meat processing

Module IV : Egg processing

Egg-Composition and nutritive value. Factors affecting egg quality. Preservation of eggs - Refrigeration and freezing, thermal processing, dehydration, coating.

Module V: Products from fish, meat and egg


Learning Resources

Reference

Semester III

VFP3S03 – Technology of Spices and Plantation Crops
(Skill Course)

Total Credits: 4
No. of instructional Hours : 4hrs/week

Aim of the course: To impart basic knowledge about the importance and production technology of spices and plantation crops.

Course Overview and Context

• To know about the importance of various types of spices which are used in the food industry and their applications
• To understand the processing steps involved in spice processing
• To know about value added products from spices
• To know various processing steps involved in plantation crop processing
Syllabus Content

Module I: Spicing processing
Introduction, classification, composition and functions. Major international quality specifications of spices. Spice processing, spice reconditioning, spice grinding, post-processing treatments. Introduction to Gas chromatography, HPLC, AAS, Spectrophotometer.

Module II: Processing of Major Spices
Major spices: Pepper, cardamom, ginger, clove, nutmeg, vanilla, cinnamon, chilli and turmeric – method of manufacture; chemistry of the volatiles; enzymatic synthesis of flavour identical.

Module III: Spice extractives
Value added spice products: Spice volatile oils, spice oleoresins, Use of spice extractives, replacement of spices with oils and oleoresins, alternative products, Ground spices, processed spices, organic spices, curry powders.

Module IV: Plantation crops-cashew processing
Composition, Structure and characteristics of cashew nut, uses, Traditional method of cashew processing, General processing, Cashew apple processing, cashew by product - CNSL.

Module V: Sugarcane and Cocoa processing
Production and processing of sugarcane, Cocoa: varieties, Processing of cocoa–Fermentation and Drying, storage. Manufacture of chocolate- couching, enrobing, milk chocolate, white chocolate, dark chocolate, cocoa butter, wafer coated chocolate, cocoa powder.

Learning Resources

References
Semester III  
VFP3S04 - Technology of Fermented Foods  
(Skill Course)

Total Credits: 4  No. of instructional Hours : 4hrs/week

Aim of the course: To impart thorough knowledge about various aspects of food fermentation process and technologies involved.

Course Overview and Context

- To make students acquainted with principles of using of microorganisms in fermentation process.
- Attain knowledge of production equipment in fermentation industry, substrate preparation and control of fermentative process and isolation of products
- Substantial time is devoted to particular fermented products -- spirits industry, yeast industry, brewing industry, production of microbial biomass and selected organic acids.

Syllabus Content

Module I: Introduction to fermentation processes

Range of fermentation processes – Microbial biomass, Microbial enzymes, Microbial metabolites, Recombinant products. Classification of fermentation process– Lactic acid fermentation, alcoholic fermentation. Importance of fermentation in food industry - Flavour enhancement, Nutritional value, Preservation, Antibiotic properties.

Module II: Microbial growth kinetics

Batch culture, Continuous culture, Comparison of batch and continuous culture in industrial processes - Biomass productivity, Metabolite productivity, Continuous brewing, Fed-batch culture - variable volume fed- batch culture, Fixed volume fed- batch culture, Application of fed-batch culture, Examples of the use of fed-batch culture.

Module III: Media and Inocula for fermentation


Module IV: Fermenter and sterilization process

Instrumentation of fermenter, basic functioning of fermenter, recovery and purification
of fermented products. Sterilization – Introduction, Sterilization of fermenter, sterilization of feeds, sterilization of liquid wastes

Module V: Fermented food products

**Fermented meat products** – Cured- raw meat, semidry fermented sausages, dry – fermented sausages, mold ripened sausages. Fermented soy products – Soy sauce, fermented whole soy beans, fermented tofu, Tempeh. **Fermented vegetables** – Chinese pickles, Kimchi, Sauerkraut. **Fermented cereal products** – Sourdough bread, croissants, rye bread, hamburger bun, Danish pastry, beer.

References


Semester III
VFP3G05 – Food Microbiology
(General Course)

Total Credits: 3 No. of instructional hours: 3hrs/week

Aim of the Course: To make students understand the food and industrial microbiology and to make them aware about the importance of food quality control by avoiding pathogenic microbial attack.

Course Overview and Context
• Recognize and describe the characteristics of important pathogens and spoilage microorganisms in foods.
• Understand the role and significance of intrinsic and extrinsic factors on growth and response of microorganisms in foods.
• Identify ways to control microorganisms in foods.
• Describe the beneficial role of microorganisms

Syllabus Content
Module I: Introduction to food microbiology
Discovery, current status, role of food microbiology, sources of micro organisms in food, changes caused by microorganisms - food fermentation, putrefaction, lipolysis. Growth and survival of
microorganisms in foods, biological, chemical and physical changes caused by microorganisms, physical and chemical methods to control microorganisms.

**Module II: Characteristics of microorganisms**
Classification of microorganisms, nomenclature, morphology – yeast and moulds, bacterial cells, viruses. Important microbes in food, microbial growth characteristics – Microbial reproduction, nature of growth in food. Food hygiene and sanitation: Contamination during handling and processing and its control; indicator organisms.

**Module III: Food preservation**
Factors influencing microbial growth in food: Intrinsic and extrinsic factor - Hydrogen ion concentration, Moisture requirement, concept of water activity, temperature, oxidation reduction potential, inhibitory substances and biological structure. Principles of different food preservation methods.

**Module IV: Spoilage in different food groups**
Food spoilage – Introduction, spoilage in cereals, vegetables and fruits, meat, eggs, poultry, fish, milk and milk products, canned foods, nuts and oil seeds, fats and oil seeds. Definition - food infection and food intoxication.

**Module V: Beneficial uses of microorganisms**
Microorganisms used in food fermentation, mechanisms of nutrient transport, application in genetics, intestinal bacteria and probiotics, food bio preservatives of bacterial origin, food ingredients and enzymes of microbial origin. Economic importance of microorganisms.

**References**

**SEMESTER III**
**VFP3S06- FOOD MICROBIOLOGY**
Practical (Skill Course)

**Credits :3**

**No. of instructional Hours : 3 Hours**

1) Study of instruments used for microbiology, cleaning and sterilization of glassware.
2) Preparation of media, techniques of incubation
3) Staining methods (monochrome staining, gram staining, flagella staining.)
4) Pure culture techniques (streak plate/pour plate).
5) Isolation of microorganism from foods, microbial examination of cereal and cereal products.
6) Microbial examination of fruits and vegetables.
7) Microbial examination of milk and milk products.
8) Microbial examination of meat and meat products.
9) Microbial examination of egg and poultry.

**SEMESTER III**

**VFP3S07- FOOD QUALITY TESTING**

**Practical (Skill Course)**

**Total Credits: 4**

**No. of instructional Hours: 4 Hours/week**

1. Determination of viscosity by Brookfield viscometer
2. Texture Profile Analysis by texture analyzer
3. Color analysis by Tint meter
4. Determination of oBrix by Refract meter
5. Sensory analysis of food products
6. Study of solid waste disposal methods
7. Study of liquid waste disposal methods
8. Visit to waste disposal section in food industry

**SEMESTER III**

**VFP3I03- Industrial visit /study tour /Internship Report**

**Credit: 2**

**Total hours:36**

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

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

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

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

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

Course Overview and Context

- To create awareness about the processing of major cereals like paddy maize.
- To study the storage and handling techniques of cereals, oilseed and pulses.
- To gain knowledge on processing and milling of pulses and extraction of oil.

Syllabus Content

Module I: Paddy Processing


Module II: Rice Milling


Module III: Wheat milling


Module IV: Milling of Pulses

Varieties-chemical composition and structure-dry milling and wet milling process of pulses, processed products of pulses.

Module V: Oil seed processing

Learning Resources

References


Semester IV
VFP4S02 – TECHNOLOGY OF BEVERAGES
(Skill Course)

Total Credits: 4 No. of instructional Hours: 4hrs/week

Aim of the course: The aim of the course is to provide the students with general scientific knowledge about processing of alcoholic and non-alcoholic beverages.

Course Overview and Context

- To study about the various beverages.
- To study about the products made out of them.
- To provide a technical view of beverages.
- To understand the manufacturing processes in the context of technology.

Syllabus content

Module I: Introduction to beverages

Types of beverages and their importance, status of beverage industry in India, Manufacturing technology for juice-based beverages, synthetic beverages; technology of still, carbonated, low-calorie and dry beverages, isotonic and sports drinks; role of various ingredients of soft drinks, carbonation of soft drinks.

Module II: Manufacturing process of beverages

Beverages based on tea, coffee, cocoa, spices, plant extracts, herbs, nuts, Dairy-based beverages.

Module III: Types of coffee and tea

Module IV : Alcoholic beverages

Types, manufacture and quality evaluation; the role of yeast in beer and other alcoholic beverages, ale type beer, lager type beer, technology of brewing process, equipments used for brewing and distillation, wine and related beverages, distilled spirits.

Module V: Packaged drinking water

Definition, types, manufacturing processes, quality evaluation and raw and processed water, methods of water treatment, BIS quality standards of bottled water; mineral water, natural spring water, flavoured water, carbonated water.

Learning Resources

Reference Books


Semester IV

VFP4G03 – By product utilization and Waste management
(General Course )

Total Credits: 4
No. of instructional Hours : 4hrs/week

Aim of the course: To understand about the ways for effective utilization of the byproducts obtained after food processing and also to gain knowledge about characterization of waste products and effluent treatment methods.

Course Overview and Context

• To identify types of wastes in food industry
• To gain knowledge in different effluent treatment methods
• To utilize the byproduct in the food industry
Syllabus Content

Module I: Introduction
Types of waste and magnitude of waste generation in different food processing industries, concept, scope and importance of waste management and effluent treatment.

Module II: Waste characterization
Temperature, pH, Oxygen demands (BOD, COD, TOD), fat, oil and grease content, metal content, forms of phosphorous and sulphur in waste waters, microbiology of waste, other ingredients like insecticide, pesticides and fungicide residues.

Module III: Effluent Treatment
Pretreatment of waste: sedimentation, coagulation, flocculation and floatation. Secondary treatments: Biological oxidation trickling filters, activated sludge process.

Module IV: Waste utilization of agro industries
Characterization and utilization of by products from cereals (breweries), pulses, oilseeds, fruits & vegetables (wineries) and plantation crops (sugar industries).

Module V: Waste utilization of animal and marine product industries
Characterization and utilization of byproducts from dairy, eggs, meat, fish and poultry.

Learning Resources

Reference


Semester IV

VFP4G04 - Marketing Management
(General Course)

Total Credits: 4  No. of instructional Hours : 4hrs/week

Course Overview and Context

- To know about the various types marketing strategy involved in generating sales for a new product food products’
- To have a basic idea about different marketing skills,
- To know the different ways in which a food can be marketed to give optimum visibility,
- To understand the importance of packaging in improving sales and the latest marketing trends

Syllabus Content

Module I: Marketing management

Introduction- Definition of marketing and marketing management- Marketing concepts and functions- Marketing research – marketing mix.

Module II: Market segmentation

Concept- Need- Basis- Market targeting- Market Positioning -Understanding consumer behaviour- Buying motives- Factors influencing consumer buying decisions

Module III: Marketing of products


Module IV: Logistic and supply chain management

Its elements- Channel of distribution types- Factors affecting the choice of a channel of distribution.

Module V: Emerging trends in marketing
Modern marketing- Direct marketing- E Marketing- Tele marketing-Viral marketing - Relationship marketing-Social marketing- Demarketing - Remarketing-Synchro marketing-Service marketing.

Semester- IV

VFP4S05 - FOOD AND BEVERAGES PROCESSING
Practical- SkillCourse

Credits :3 No. of instructional Hours : 3 hrs/week

PRACTICALS:
1) Examination of physical impurities of water
2) Determination of brix: acid ratio of the beverage.
3) Determination of SO₂ content of soft drink.
4) Preparation of grape wine
5) Determination of saccharin
6) Determination of total CO₂ of water
7) Determination of free CO₂ of water
8) Determination of total sulphates in water
9) Determination of total alkalinity of water
10) Preparation of carbonated beverages
11) Visit to beverage processing unit

Semester IV

VFP4S06- Cereals, Pulses and Oilseeds (Practical)
Practical- Skill Course

Total Credits: 3 No. of instructional Hours : 3hrs/week

Course Overview and Context:
• To understand the physical properties of cereal flours.
• To impart knowledge on working of a rice milling station.
• To impart knowledge on working of a oil expelling unit station.

Syllabus Content
1. Physical characteristics of Wheat.
2. Estimation of Gluten Content of flour.
5. Fermenting power of yeast.
6. Physical Characteristics of Rice and paddy.
7. Cooking characteristics of rice.
8. Determination of sedimentation power of flour.
9. Visit to rice mill station.
10. Visit to oil expelling unit.

**Semester IV**

**VFP4G07 - Business Management**
(General Course)

**Total Credits: 64**

**No. of instructional Hours : 4hrs/week**

**Course Overview and Context**

- To familiarize the students with concepts and principles of Management

**Syllabus Content**

**Module I: Management**


**Module II: Planning**

Nature, importance and purpose of planning - Planning process, objectives - Types of plans MBO-Features-steps.

**Module III: Organizing and Staffing**


**Module IV :Directing**
Meaning and nature of directing - Motivation - meaning - importance - Theories of Motivation (Maslow, Herzberg, McGregor, X & Y theory) Leadership - Meaning - Styles Managerial Grid by Blake and Mounton - Likert’s Four level model - Coordination - Meaning and importance.

Module V: Controlling

Meaning and steps in controlling - Essentials of a sound control system - Methods of establishing control - Control by Exception.

Learning Resources

References

3. L M Prasad, Principles of management.

Semester- IV
VFPI04 - PROJECT / INDUSTRIAL VISIT / STUDY TOUR / INTERNSHIP REPORT

Total Credits : 4  Total Hours : 72

Project/Industrial visit/Institutional visit study tour based on the any one subject related to the syllabus

i. Presentation of study tour report

ii) Submission of study tour report

iii) Submission of Project report/ Viva – Voce

The evaluation of Project/Industrial visit/ study tour will be conducted along with the practicals.
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Aim of the course: To understand about the proper post harvest handling technologies of fruits and vegetables and to know the process of development of fruit and vegetable processing products.

Course Overview and Context

- To know about the status of fruit and vegetable production in India with importance to losses.
- To study about the processing of fruits and vegetables.
- To impart knowledge about the various products from them.
- To study the various methods of drying of fruits and vegetables

Syllabus Content

Module I: Introduction

Composition and nutritive value of fruits and vegetable. Factors effecting composition and quality of fruits and vegetables. Quality requirements of raw materials for processing; sourcing and receiving at processing plants, primary processing: grading, sorting, cleaning, washing, peeling, slicing and blanching

Module II: Spoilage of fruits and vegetables


Module III: Processing of fruits and vegetables

Dehydration of fruits and vegetables using various drying technologies like sun drying, solar drying (natural and forced convection), osmotic, tunnel drying, fluidized bed drying, freeze drying, convectional and adiabatic drying; applications to raisins, dried figs, vegetables, intermediate moisture fruits and vegetables. Fruit powders using spray drying. Technology of extraction of juices from different types of fruits.

Module IV: Manufacture of Fruit products

Module V: Manufacture of vegetable products

Manufacturing process of sauce, ketchup, vegetable juices and concentrated products.

Learning Resources

Reference Books

Semester V
VFP5S02 – Food Chemistry
(Skill Course)

Total Credits: 5  No. of instructional Hours : 5hrs/week

Aim of the course: To explain the chemical composition and functional properties of food.

Course Overview and Context

- To study about the major and minor components of food and their properties
- To know about the changes that occurs in foods during processing.
- To study the classification, structure and chemistry of the various food components.
- To understand the changes that occurs in the different constituents during storage and ways and means to prevent it.

Syllabus Content

Module I: Water

Introduction to food chemistry, structure of water molecule, hydrogen bonding, effect of hydrogen bonding on the properties of water, moisture in foods, free water, bound water, water activity, estimation of moisture in foods, determination of moisture and water
activity.

**Module II: Carbohydrates**

Nomenclature, composition, sources, structure, reactions, functions, classification - monosaccharide, disaccharides, oligosaccharides and polysaccharides. Properties of Starch – gelatinization, gel formation, syneresis, starch degradation, dextrinisation, retrogradation, Qualitative and quantitative tests of carbohydrates.

**Module III: Proteins**

Nomenclature, sources, structure, functions, classification - essential and non-essential amino acids, Physical and chemical properties of proteins and amino acids, functional properties - denaturation, hydrolysis, changes in proteins during processing. Enzymes - Specificity, mechanism of enzyme action, factors influencing enzymatic activity, controlling enzyme action, enzymes added to food during processing, enzymatic browning.

**Module IV: Fats and oils**

Nomenclature, composition, sources, structure, functions, classification, essential fattyacids. Physical and chemical properties - hydrolysis, hydrogenation, rancidity and flavour reversion, emulsion and emulsifiers, saponification value, acid value and iodine value, smoke point.

**Module V: Pigments, colours and flavours in food**

Micro nutrients: Vitamins and minerals, Pigments indigenous to food, structure, chemical and physical properties, effect of processing and storage, colours added to foods, flavours- vegetable, fruit and spice flavours, flavours of milk and meat products, effect of processing on flavour components.

**Reference Books:**


Semester V
VFP5S03- Food Quality Assurance
(Skill Course)

Total Credits: 4 No. of instructional Hours : 4hrs/week

Aim of the course: To acquaint with food quality parameters and control systems, food standards, regulations, specifications.

Course Overview and Context

- To understand the principles and framework of food safety.
- To understand food laws and regulations governing the quality of foods.
- To apply preventive measures and control methods to minimize microbiological hazards and maintain quality of foods.
- To identify the wide variety of parameters affecting food quality.
- To understand about Intellectual property rights.

Syllabus Content

Module I: Concept of quality

Quality attributes- physical, chemical, nutritional, microbial, and sensory; their measurement and evaluation; Sensory vis-à-vis instrumental methods for testing quality.

Module II: Concepts of quality management

Objectives, importance and functions of quality control, Quality management systems in India, Sampling procedures and plans, Food Safety and Standards Act, 2006, Domestic regulations, Global Food safety Initiative, Various organizations dealing with inspection, traceability and authentication, certification and quality assurance - PFA, FPO, MMPO, MPO, AGMARK, BIS; Labeling issues, International food standards.

Module III :HACC system

Hazard analysis Critical Control Point: Definition, principles, Guidelines for the application of HACCP system.

Module IV: Food Quality Laws and Regulations

Quality assurance, Total Quality Management, GMP/GHP, GLP, GAP, Sanitary and hygienic practices, HACCP, Quality manuals, documentation and audits; Indian & International quality systems and standards like ISO and Food Codex, Export import policy, export documentation, Laboratory quality procedures and assessment of laboratory performance, Applications in different food industries, Food adulteration and food safety.

Module V: Intellectual Property Rights

Reference Books

Semester V
VFP5G04 – Computer Applications
(General Course)

Total credits: 4
No. of instructional Hours : 4hrs/week

Course Overview and Context

- To understand the operations of windows operating system, desktop, text editing and printouts in word pad
- To understand the operations of MS WORD-(Editing, Formatting, inserting)
- To understand the various operations in MS-Excel

Syllabus Content
Module I: Office Automation
Introduction-Tools, Windows 7, desktop, files and folders, printers, Microsoft Office button, Quick access tool bar

Module II: MSWord 7
Introduction- Typing text, Saving, opening, Closing, common edit functions (cut copy paste, change case). Text Editing - Inserting text, spell check, correcting mistakes, common formatting functions. Formatting paragraph, tables, bullets & numbering, inserting clipart & word art, picture & Drawing tool bar, Header & footer.

Module III: MSExcel7
Introduction- Parts of MS Excel windows, opening, saving and closing, workbook, entering data and numbers, Texts, date & time, formatting data, tool bar, drawing in MS Excel, Drawing tool bar, formatting & editing worksheet. Format cells, row, column, work sheet (Inserting, deleting, renaming) Formulas, functions, charts.
Module IV: MS PowerPoint 7
Introduction- Parts of power point windows. Features, background design, word art, clipart, 3D settings. Animations, sound views, types of views, inserting, deleting, arranging slides, slideshows

Module V: DBMS, Internet &Email
DBMS Intro & basic concepts, Internet introduction, Creating Email- Inbox, compose, draft, attachments.

Learning Resource

References

1. Study material for Diploma in Computer Application, Centre for continuing Education, Kerala.
2. Tom Bunzel, MS Office Research Guide; InformationIT.com.

Semester V
VFP5G05- Personality Development
(General Course)

Total Credits: 4  No. of instructional Hours : 4 hrs/week

Aim of the course: To understand the strategies for the personality development and to improve the personality of the employees upon organizational effectiveness.

Course Overview and Context

• To bring about personality development with regard to the different behavioral dimensions.

Syllabus Content
Module I:Leadership
Introduction to Leadership, Leadership Power, Leadership Styles, Leadership in administration

Module II:Interpersonal Relations
Introduction to Interpersonal Relations, Analysis of different ego states, Analysis of Transactions, Analysis of Strokes, Analysis of Life position
Module III: Stress and Conflict Management
Introduction to Stress, Causes of Stress, Impact Stress, Managing Stress. Conflict: Introduction to Conflict, Causes of Conflict

Module IV :Time Management
Time as a Resource, Identify Important Time Management Wasters, Individual Time Management Styles, Techniques for better Time Management.

Module V: Motivation
Introduction to Motivation, Relevance and types of Motivation, Motivating the subordinates, Analysis of Motivation

Semester - V
VFP5S06-FOOD CHEMISTRY

Practical-Skill Course
Total Credits : 4
No. of instructional Hours : 4hrs/week

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

Semester V
VFP5G07 - FOOD PROCESSING EQUIPMENTS
(General Course)

Total Credits: 4
No. of instructional Hours : 4hrs/week

Aim of the course: To introduce basic equipment design and various control mechanisms.
Course Overview and Context
• To enable the student to design and develop equipments used in Food Processing operations.
• To identify and discuss critical design of typical processing equipment.
• To Understand the relationship between process design and Safety

Syllabus Content
Module I: Introduction to equipments used in food industry
Equipments: Types, planning, factors affecting selection and purchase

Module II: Mechanical Equipments

Module III: Heat exchangers, dryers and evaporators

Module IV: Refrigeration and thermal processing equipments
Refrigeration and freezing equipments: Refrigerants, freezers, chillers. Thermal processing equipments: sterilizers, pasteurizers, blanchers.

Module V: Food packaging Equipments
Introduction, preparation of food containers, filling equipments, closing equipments, group packaging.

Learning Resources
Reference Books
### Semester VI

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Semester VI
VFP6G01 - Unit Operations in Food Industry
(Skill Course)

Total credit: 4 No. of instructional Hours : 4hrs/week

Aim of the course: To provide in-depth knowledge in basic concepts of various unit operations in a food industry.

Course Overview and Context

- To understand the different operations performed in food industry
- To know details of working of different equipments

Course Outline

Module I: Heat Transfer in Food Processing


Module II: Evaporation

Basic principle, need for evaporation, single effect, multiple effect, heat economy, type of evaporator-long tube, short tube, agitated film evaporator.

Module III: Distillation and crystallization

Simple distillation, flash distillation, steam distillation, fractional distillation
Crystallization -theory, tank crystallizer and scraped surface crystallizer.

Module IV: Extraction and extrusion

Solid Liquid extraction-leaching, Liquid-Liquid extraction, Super critical fluid extraction, single screw extruder, twin screw extruder

Module V: Mechanical separation and material handling

Sedimentation, Centrifugal separation, filtration, Mixing, Material handling-Belt conveyor, Screw Conveyer, bucket elevator and pneumatic conveyer.
Learning Resources

References


Semester VI

VFP6G02- Emerging Technologies in Food Industry
(General Course)

Total Credits: 4 No. of instructional Hours : 4hrs/week

Aim of the course: To understand about new developments in food industry and to impart knowledge about the importance and applications of the technology.

Course Overview and Context

• To enable the student to understand: Emerging / alternative technologies applied to food processing.
• Relative advantages / disadvantages over existing technologies.
• Economics and commercialization of newer technologies.

Syllabus Content

Module I: Membrane separation process
Membrane Technology-process- Micro-filtration, Ultra-filtration, Nano-filtration and Reverse Osmosis-advantages-equipment

Module II: High pressure processing and microwave heating
Microwave heating of foods- Mechanism of Heat Generation-Working of microwave
oven. High Pressure processing: Concept - Equipment for HPP Treatment - Mechanism of Microbial Inactivation and its Application in Food, dielectric heating of foods

**Module III: Irradiation and PEF and ohmic heating**

Pulsed electric field – equipment – mechanism of PEF - advantages, Ohmic heating of foods - mechanism - principle - advantages, applications. Irradiation - principle - types of irradiation - advantages - applications

**Module IV: Osmotic dehydration of foods and minimal processing**

Principle – Mechanism of osmotic dehydration – Effect of process parameters on mass transfer – Methods to increase the rate of mass transfer – Applications – Limitations of osmotic dehydration – Management of osmotic solutions. Minimal processing - principle - methods - advantages

**Module V: Nanotechnology and antimicrobial technology**

Role of Antimicrobial agents in food – Plant and animal derived antimicrobials – Antimicrobial enzymes, antimicrobial food packaging, nanotechnology - application of nanotechnology in food industry

**Learning Resources**

**Reference Books**


Semester -VI
VFP6S03-FOOD PACKAGING
Practical-Skill Course

No. of Credits :3
No. of instructional Hours : 3hrs/week

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

Semester -VI
VFP6S04- SNACK FOODS PROCESSING
Practical-Skill Course

No. of Credits:3
No. of instructional Hours : 3hrs/week

1) Preparation of Papad and its quality evaluation
2) Preparation of Chips and its quality evaluation
3) Preparation of Wafers and its quality evaluation
4) Preparation of Flaked cereals (Poha) and its quality evaluation
5) Preparation of Puffed cereals (Churmura) and its quality evaluation
6) Preparation of Expanded snack and its quality evaluation
7) Preparation of Roasted grains or nuts and its quality evaluation
8) Preparation of Coated grains or nuts and its quality evaluation
9) Preparation of instant food premixes and its quality evaluation
10. Visits to snack foods manufacturing industries
Semester VI  
VF6G05 – FOOD SERVICE MANAGEMENT  
(General Course)

Total Credits: 4  
No. of instructional Hours : 4hrs/week

Aim of the course: To understand the functioning of food service establishments. And to acquire knowledge about the services that should be given by a food service establishment.

Course Overview and Context
• To understand the organisation of food service establishments
• To understand the management of human, material and financial resources.
• To be familiar with various concepts involved in quantity and quality food production and service.
• To understand the need for efficient personnel management in the food industry.

Syllabus Content

Module I: Introduction to Food Service Establishments 8 Hours
Types of food service establishments. Planning for a food service unit- Planning, investment, Project report, Registration (License and Inspection).

Module II: Menu Planning and table setting 14 Hours
Menu Planning- importance, types, steps in planning. Requisites in designing a menu card, Methods of purchase, delivery, receiving, storage types. Table Setting and Arrangement - Indian and Western Styles of Table Setting, Table Appointments, Napkin folding styles, Flower arrangement, Table Etiquettes.

Module III: Food Service and Delivery system 15 Hours
Centralized and decentralized delivery systems, types of food service systems conventional, commissary, ready prepared, assembly, service styles - table, counter, tray, silver, plate, cafeteria, buffet. Specialized forms of food service - hospitals, airline, rail, homedelivery, catering and banquet, room and lounge service.

Module IV: Food Service Management 15 Hours
Managing an organization, Process involved, Principles of management, Functions of management- planning, organizing, directing, co-ordinating, evaluating, and controlling. Total quality management, Management by objectives. Work design, job design, work study and simplification.

Module V: Accounting 8 Hours
Book keeping, books of accounts, Journal, Ledger, trial balance, balance sheet, profit analysis, food cost control.

Learning Resources
Reference Books

SEMESTER VI
VFP6I06- MAJOR PROJECT

No. of Credits: 12     Total Hrs: 216

Project based on the any one subject related to the syllabus/ Scheme

i) Submission of Project Report
ii) Presentation of project report
iii) Viva – Voice