Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science & Commerce, Baramati

(Autonomous)

Three/Four Year Honours/Honours with Research B.Voc. Degree

Program in Food Processing and Post Harvest Technology

(Faculty of Science)

CBCS Syllabus

FY B.Voc. (Food Processing and Post Harvest Technology)

For Department of Food Technology and Research

Choice Based Credit System Syllabus

(2023 Pattern)

(As Per NEP-2020)

To be implemented from Academic Year 2025-2026

Title of the Programme: TY B.Voc. (Food Processing and Post Harvest Technology))

Preamble

AES's, Tuljaram Chaturchand College of Arts, Science and Commerce (Autonomous) has made the decision to change the syllabi of across various faculties from June, 2023 by incorporating the guidelines and provisions outlined in the National Education Policy (NEP), 2020. As per the recommendation of stearing committee meeting held on 22nd and 23rd April 2025 they have suggested separate guideline for vocational programme. This syllabus is according to the same guideline. The NEP envisions making education more holistic and effective and to lay emphasis on the integration of general (academic) education, vocational education and experiential learning. The NEP introduces holistic and multidisciplinary education that would help to develop intellectual, scientific, social, physical, emotional, ethical and moral capacities of the students. The NEP 2020 envisages flexible curricular structures and learning based outcome approach for the development of the students. By establishing a nationally accepted and internationally comparable credit structure and courses framework, the NEP 2020 aims to promote educational excellence, facilitate seamless academic mobility, and enhance the global competitiveness of Indian students. It fosters a system, where educational achievements can be recognized and valued not only within the country but also in the international arena, expanding opportunities and opening doors for students to pursue their aspirations on a global scale.

In response to the rapid advancements in science and technology and the evolving approaches in various domains of Food Technology and related subjects, the Board of Studies in Food Technology at Tuljaram Chaturchand College of Arts, Science and Commerce (Autonomous), Baramati - Pune, has developed the curriculum for the first semester of F.Y. B.Voc. Food Technology, which goes beyond traditional academic boundaries. The syllabus is aligned with the NEP 2020 guidelines to ensure that students receive an education that prepares them for the challenges and opportunities of the 21st century. This syllabus has been designed under the framework of the Choice Based Credit System (CBCS), taking into consideration the guidelines set forth by the National Education Policy (NEP) 2020, LOCF (UGC), NCrF, NHEQF, Prof. R.D. Kulkarni's Report, Government of Maharashtra's General Resolution dated 20th April and 16th May 2023, and the Circular issued by SPPU, Pune on 31st May 2023.

A Food Technology Graduates degree equips students with the knowledge and skills necessary for a diverse range of fulfilling career paths. Food Technology graduate students find opportunities in various fields, including procurement, Testing and quality, Processing and Production, Research and Development, Storage and Supply Chain Management, Food Regulatory Agencies, Auditing, Academics, Competitive exams, Biostatistics, Database analysis, Entrepreneurship Development, and many other food and food related organizations.

Throughout their Three-year degree program, students explore the significance of Farm to Fork processing by utilization of post harvest technology. They learn tool, techniques, process which is required to set up agencies including pickles, jam, and jelly, fruit processing, vegetable processing, organic product, dairy products, Bakery and Confectionery products, producing industries.

Overall, revising the Food Technology syllabi in accordance with the NEP 2020 ensures that students receive an education that is relevant, comprehensive, and prepares them to navigate the dynamic and interconnected world of today. It equips them with the knowledge, skills, and competencies needed to contribute meaningfully to society and pursue their academic and professional goals in a rapidly changing global landscape.

Programme Specific Outcomes (PSOs)

PSO-1	**Disciplinary Knowledge**	Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
PSO-2	**Communication Skills**	Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
PSO-3	**Critical Thinking**	Propose novel idea sin explaining the scientific data, facts and figures related to Science and technology.
PSO-4	**Analytical Reasoning and Problem Solving**	To enable the students with good scientific and engineering knowledge so as to comprehend,design,and create food products and devices for the food industry and provide solutions for the challenges in the food industry as well as in agriculture.
PSO-5	**Senseof Inquiry**	Curiously ask relevant questions for better understanding of fundamental concepts and principles,scientific theories and applications related tothestudy.
PSO-6	**UseofModern Tools**	Operatemoderntools,equipment,instrumentsandlaboratorytechniquesto perform the experiments and write the programs in different languages.
PSO-7	**Research Skills**	Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
PSO-8	**Applicationof Knowledge**	Developascientificoutlookandapplytheknowledgewithrespecttofood technology.
PSO-9	**Ethical Awareness**	Totrainstudentsinprofessionalandethicalattitude,effectivecommunication skills, teamworkskillsandmultidisciplinaryapproachesrelatedtofoodtechnology and engineering.
PSO-10	**Teamwork**	Understandthebasicconcepts,fundamentalprinciplesandexperimental findings and the scientific theories related to food technology, food science and food technology & engineering and its other fields related to the program.
PSO-11	**Environmentand Sustainability**	Developvariouscommunicationskillssuchasreading,listeningandspeaking skills to express ideas and views clearly and effectively.
PSO-12	**LifelongLearning**	Propose novel ideas in explaining the scientific data, facts and figures related to science and technology.

Tuljaram Chaturchand College
of Arts, Science and Commerce Baramati, Dist-Pune
(Empowered Autonomous)
Board of Studies in Food Technology and Research
(Academic Year 2025-26 to 2027-28)

Sr.No.	Name of Member	Designation
1.	**Dr. Khan Wazid A.** Head &Assistant Professor Department of Food Technology and Research, T. C. College, Baramati.	**Chairperson**
2.	**Ms. Katekar Asawari D.** Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
3.	**Ms.Pawar Tilotama R.** Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
4.	**Ms. Shinde Soudamini S.** Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
5.	**Ms. Darandale Tejaswini B.** Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
6.	**Ms. Aarti Dongare** Assistant Professor, M.Sc. Food Science & Technology	Vice-Chancellor Nominee Subject Expert from SPPU, Pune
7.	**Mr. Gatade Abhijeet** Assistant Professor, Shivaji University, Kolhapur	Subject Expert from Outside the Parent University
8.	**Mr. Pathan Fayaz L.** Associate Professor, MIT-ADT University	Subject Expert from Outside the Parent University
9.	**Mr. Gawate Dadasaheb** Director, Di-Roma Ice-cream, Ahmad Nagar	Representative from industry/corporate sector/allied areas
10.	**Mr. Vairagal Dnyaneshwar** Schreiber Dynamix Pvt. Ltd. Baramati	Member of the College Alumni
11.	**Ms. Vhora Payal**	UG Student
12.	**Ms. Pawar Amruta**	PG Student

Information

1. **One semester** = 15 weeks (12 weeks actual teaching and 3 weeks for internal evaluation, tutorials, problem solutions, student's difficulty solution, etc.)
2. As per NCrF :
   - Theory course: A minimum of 15 hours of teaching per credit is required.
   - Laboratory course: A minimum of 30 hours in laboratory activities per credit is required.
3. **1-credit theory** = 15 hours i.e. for 1 credit, 1 hour per week teaching is to be performed.

   15 hours of 1-credit are splinted as 12 hours actual teaching + 3 hours Tutorial (practice problem solving sessions, repeated discussion on difficult topics, and discussion on student's difficulties, questions discussion and internal evaluation)

4. **1-credit practical** = 30 hours. Thus, 1 credit practical = 2 contact hours in laboratory per week

   30 hours splinted as 24 hours' actual table work and 6 hours for journal competition, oral on each practical and other internal evaluation.

5. **Each theory courses of any type** (Major, Minor, VSC, VEC, OE/GE, VEC, SEC, CC, etc.) **is of 2 credits**.
   a. **Theory per semester:** Contact hours = 24 teaching + 6 tutorials (problem solving sessions, repeated discussion on difficult topics, difficult solution, questions discussion and internal evaluation)
   b. Each course will be of two modules, One module = 15 hours
   c. Each module may consist of one or more than one chapter.
6. **Each practical course of any course is of 2 credits = 60 hours per semester**
   a. Minimum 12 laboratory sessions must be conducted in one semester.
   b. Each laboratory sessions should be 4 hours.
   c. If practical is short, then two short practicals should be included in one laboratory sessions.
   d. In 12 laboratory sessions maximum 2 demonstration sessions or table work sessions may be included and must be designed carefully for 4 hours' sessions.
   e. 4 hours' laboratory sessions include – performing table work (practical), calculation, writing results and conclusion, and submission of practical in written form to practical in charge.
   f. Pre-laboratory reading and post laboratory work / questions should be assigned on each practical and this will be the part of internal evaluation.
7. **Design syllabus of each theory and practical course as per above guidelines.**
   a. **Theory syllabus** should be given module wise and chapter wise.

b. **Theory syllabus** should include name of topic, number of teaching hours allotted, detailed point wise syllabus, page numbers, references book no.

c. It is recommended that**, design syllabus of one theory course from maximum two references books** and they will be called as main reference books/text books. Below that, you can add names of more reference books and they will be supplementary reference books.

d. **Syllabus of practical** must be given practical wise. Name of experiment and aim of the experiment should be clearly mentioned. Mention reference book number or bibliography for each practical. At least 16 practicals' must be included in syllabus from which 12 practicals will be actually conducted. If practical is short, then two short practicals' will be considered as one practical.

e. At the end of syllabus of theory and practical course, a list of references book should be given number wise.

f. **At the end of each theory and practical course 6 CO should be given.**

4.. Names of UG and PG courses related to Specialization

Important Note: For specialized subjects wherever designing of practical course is not adequate then included, theory course of 2 credits in place of practical course.

Semester	Major Courses	Major Elective Curses	Minor Curses	VSC	IKS
I	2 theory + 1 Practical			1 Theory	1 Theory
II	2 theory + 1 Practical		1 Theory + 1 Practical	1 Practical	0
III	3 theory + 1 Practical		1 Theory + 1 Practical	1 Theory	0
IV	3 theory + 1 Practical		1 Theory + 1 Practical	1 Practical	0
V	3 theory + 2 Practical	1 Theory + 1 Practical	1 Theory + 1 Practical	1 Theory	0
VI	3 theory + 2 Practical	1 Theory + 1 Practical		1 Practical	0
	VII and VIII Sem honours degree with major				
VII	5 theory + 2 Practical	1 Theory + 1 Practical	0	0	0
VIII	5 theory + 2 Practical	1 Theory + 1 Practical	0	0	0
	VII and VIII Sem honours degree with research				
VII	4 theory + 1 Practical	1 Theory + 1 Practical	0	0	0
VIII	4 theory + 1 Practical	1 Theory + 1 Practical	0	0	0

- In elective course 2T+2P are related to each other. In this case students have to choose more than 1 option i.e. in elective part, at least 2 courses each consisting of 1 theory 1 practical courses in combination

Course Structure for T Y. B. Voc. (Food Technology) 2025-2026

Sem	Course Type	Course Code	Course Title	Theory/ Practical	Credits
V	Major Mandatory	FTR-301-MJM	Dairy Technology	Theory	02
	Major Mandatory	FTR -302-MJM	Post Harvest Technology	Theory	02
	Major Mandatory	FTR -303-MJM	Food Quality, Laws and Regulations	Theory	02
	Major Mandatory	FTR -304-MJM	Dairy Technology	Practical	02
	Major Mandatory	FTR -305-MJM	Post Harvest Technology	Practical	02
	Major Elective (MJE)	FTR -306-MJE(A)	Plantation Crop	Theory (Any two)	04
	Major Elective (MJE)	FTR -306-MJE(B)	Beverage Technology		
	Major Elective (MJE)	FTR -306-MJE(C)	Spice Technology		
	Minor	FTR -341-MN	Cereal Technology	Theory	02
	Minor	FTR-342-MN	Cereal Technology	Practical	02
	Vocational Skill Course (VSC)	FTR -321-VSC	Entrepreneurship Development	Practical	02
	Field Project(FP)	FTR -335-FP	Field Project	Practical	02
	Total Credits Semester-V				**22**
VI	Major Mandatory	FTR -351-MJM	Packaging Technology	Theory	02
	Major Mandatory	FTR -352-MJM	Food Safety, Hygiene and Sanitation	Theory	02
	Major Mandatory	FTR -353-MJM	Plant Design and Layout	Theory	02
	Major Mandatory	FTR -354-MJM	Animal Product Technology	Practical	02
	Major Mandatory	FTR -355-MJM	Packaging Technology	Practical	02
	Major Elective(MJE)	FTR -356-MJE(A)	Meat Processing Technology	Theory (Any two)	04
	Major Elective(MJE)	FTR -356-MJE(B)	Fish Processing Technology		
	Major Elective(MJE)	FTR -356-MJE(C)	Poultry Processing Technology		
	Minor	FTR -361-MN	Pulses and Oilseed Technology	Theory	02
	Minor	FTR -362-MN	Pulses and Oilseed Technology	Practical	02
	On Job Training(OJT)	FTR -385-OJT	On Job Training	Practical	04
				Total Credits Semester-VI	**22**
				Total Credits Semester-V+ VI	**44**

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:**Major

Course Code **:** FTR-315-MJM

Course Title **:** Packaging Technology

No. of Credits **: 02**

No. of Teaching Hours **:** 30

Course Objectives:

1. To learn about the food groups
2. To study about the cooking methods
3. To know about working of various equipment used in food processing industries.
4. To get a knowledge about food preservation techniques.
5. To study about the history food processing technology.
6. To learn about the Scope & opportunities in food industries.
7. To study the refrigeration system

Course Outcomes:

CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO3: The students may know about working of various equipment used in food processing industries.
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.
CO7: The students will know about the advantages & disadvantages of cooking.

Topics and Learning Points

Unit-1: Introduction: **07 Periods**

Protection of Food products - major role of food packaging - Functions of packaging, Need for protective packaging. Packaging requirements and selection of packaging materials; Types of Container, packaging materials and Forms: Paper and Glass.

07 Periods

Unit-2:

Metals: Tinplate containers, tinning process, components of tinplate, tin free steel (TFS), types of cans, aluminum containers, lacquers; Plastics: types of plastic films, laminated plastic materials, co-extrusion, edible films, biodegradable plastics.

Unit-3: **08 Periods**

Test for Packaging Materials, their methods of testing and evaluation; Barrier properties of packaging materials: Theory of permeability, factors affecting permeability, permeability coefficient, gas transmission rate (GTR) and water vapor transmission (WVTR) rate and its measurement. Food packaging systems: Different forms of packaging such as rigid, semi rigid, flexible forms and different packaging system for (a) dehydrated foods (b) frozen foods (c) dairy products (d) fresh fruits and vegetables (e) meat, poultry and sea foods.

Unit-4: **08 Periods**

Vacuum, CA and MA packaging systems, gas packaging machine; seal and shrink packaging machine; form and fill sealing machine; aseptic packaging systems; bottling machines; carton making machines.

References:

1. Crosby NT.1981. *Food Packaging: Aspects of Analysis and Migration Contaminants*. App. Sci. Publ.
2. Kadoya T. (Ed). 1990. Food Packaging. Academic Press.
3. Mahadeviah M & Gowramma RV. 1996. *Food Packaging Materials*. Tata McGraw Hill.
4. Palling SJ. (Ed). 1980. *Developments in Food Packaging*. App. Sci. Publ.
5. Painy FA. 1992. *A Handbook of Food Packaging*. Blackie Academic.
6. Sacharow S & Griffin RC. 1980. *Principles of Food Packaging*. AVI Publ.
7. Stanley S & Roger CG.1970. *Food Packaging*. AVI Publ.
8. Gordon L. Robertson: Food Packaging- Principles and Practice Marcel Dekker Inc,USA (1993)
9. Donald Downing: Complete Course in Canning (3 Volumes) CTI Publications inc, USA (1996)
10. Mathlouthi M. (Editor): Food Packaging and Preservation Elsevier Applied Science Publications Essex, UK (1986)
11. J. R.D.David, R. H Graves and V.R. Carlson: Aseptic Processing and Packaging of Foods: CRC Press, New York

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc Subject: Packaging Technology

Course Type: Major Course Code: FTR-351-MJM

Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	3	3	-	-
CO2	1	1	-	-	-	3	-	-	-	1	3	-
CO3	-	1	-	2	1	-	-	3	-	-	-	-
CO4	1	-	2	-	-	-	1	-	-	1	-	3
CO5	2	-	-	-	1	-	-	2	1	2	1	-
CO6	1	-	-	-	1	4	-	-	1	1	-	-
CO7	-	-	1	-	-	-	-	-	1	-	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods
CO3: The students may know about working of various equipment used in food processing industries.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology.
CO4: Students will study about the history food processing technology.
CO7: The students will know about the advantages & disadvantages of cooking.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO3: The students may know about working of various equipment used in food processing industries.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.

CO3: The students may know about working of various equipment used in food processing industries.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO6: Use of modern tools To operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO2: Student will study about the different cooking methods
CO6: Students will get knowledge about food preservation techniques.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO4: Students will study about the history food processing technology.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO3: The students may know about working of various equipment used in food processing industries.
CO5: The students will learn about the Scope & opportunities in food industries.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO1: Student will learn about the food groups.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.
CO7: The students will know about the advantages & disadvantages of cooking.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods
CO5: The students will learn about the Scope & opportunities in food industries.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO4: Students will study about the history food processing technology.

CBCS Syllabus as per NEP 2020 for F.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **VI**

Course Type **: Major**

Course Code **:** FTR-352-MJM

Course Title **: Food Safety, Hygiene and Sanitation**

No. of Credits **: 02**

No. of Teaching Hours **: 30**

Course Objectives:

1. To learn about the food groups
2. To study about the cooking methods
3. To know about working of various utensils used in food processing industries.
4. To get a knowledge about food preservation techniques.
5. To study about the weight and measures
6. To learn about the mode of heat transfer.
7. To get knoledge about refrigration system.

Course Outcomes:

CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO3: the students may know about working of various utensils used in food processing industries.
CO4: Students will get knowledge about food preservation techniques
CO5: The students will learn about the weight and measures used in food processing
CO6: Students will get knowledge about mode of heat transfer.
CO7: The students will know about the refrigration system.

Topics and Learning Points

Unit-1: Introduction to Food Safety: **07 Periods**

Definition, Types of hazards, biological, chemical, physical hazards, Factors affecting Food Safety, Importance of Safe Foods.

Unit-2: Food Safety Management Tools **07 Periods**

Basic concept, Prerequisites- GHPs ,GMPs, SOPs etc, HACCP, ISO series, TQM - concept and need for quality, components of TQM, Kaizen. Risk Analysis, Accreditation and auditing

Unit-3: Industrial byproducts and waste utilization: **07 Periods**

Potential & prospects of byproduct & waste utilization from the food Industries in India Byproduct & waste with special reference to Agricultural & agro based industries, cereal & cereal product, fruits and vegetable, meat, Poultry and fish, milk & milk products.

Unit-4: Hygiene and Sanitation in Food Service Establishments: **07 Periods**

Introduction, Sources of contamination, Control methods using physical and chemical agents, Waste Disposal, Pest and Rodent Control, Personnel Hygiene, Food Safety Measures.

Recent concerns: New and Emerging Pathogens, Packaging, Product labelling and Nutritional labeling, genetically modified foods\Transgenic, Organic foods, Newer approaches to food safety, Recent Outbreaks

References:

1. Lawley, R., Curtis L. and Davis,J. The Food Safety Hazard Guidebook , RSC publishing, 2004
2. De Vries. Food Safety and Toxicity, CRC, New York, 1997
3. Marriott, Norman G. Principles of Food Sanitation, AVI, New York, 1985
4. Forsythe, S J. Microbiology of Safe Food, Blackwell Science, Oxford, 2000 &Sons; USA, 1987
5. Quality Control for Food Industry – Krammer & Twig

Mapping of Program Outcomes with Course outcomes

Class: TY B.Voc. Subject: Food Safety , Hygiene and Sanitation

Course Type: Major Course Code: FTR-352-MJM

Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO1	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**
CO2	**1**	**1**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	**-**	**1**	**-**	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
CO4	**1**	**-**	**2**	**-**	**-**	**-**	**1**	**-**	**-**	**2**	**-**	**3**
CO5	**-**	**-**	**-**	**3**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**
CO6	**2**	**-**	**-**	**2**	**-**	**3**	**2**	**-**	**1**	**-**	**-**	**-**
CO7	**-**	**-**	**-**	**3**	**2**	**3**	**-**	**1**	**-**	**2**	**-**	**1**

PO1: Disciplinary knowledge Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO4: Students will get knowledge about food preservation techniques
CO6: Students will get knowledge about mode of heat transfer.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods
CO3: the students may know about working of various utensils used in food processing industries.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO4: Students will get knowledge about food preservation techniques

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO3: the students may know about working of various utensils used in food processing industries.
CO5: The students will learn about the weight and measures used in food processing
CO6: Students will get knowledge about mode of heat transfer.
CO7: The students will know about the refrigration system.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO3: the students may know about working of various utensils used in food processing industries.
CO7: The students will know about the refrigration system.

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.

CO2: Student will study about the different cooking methods
CO5: The students will learn about the weight and measures used in food processing
CO6: Students will get knowledge about mode of heat transfer.
CO7: The students will know about the refrigration system.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO4: Students will get knowledge about food preservation techniques
CO5: The students will learn about the weight and measures used in food processing
CO6: Students will get knowledge about mode of heat transfer.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO3: the students may know about working of various utensils used in food processing industries.
CO7: The students will know about the refrigration system.

PO9: Ethical awareness To train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO1: Student will learn about the food groups.
CO6: Students will get knowledge about mode of heat transfer.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Student will learn about the food groups.
CO4: Students will get knowledge about food preservation techniques
CO7: The students will know about the refrigration system.

PO11: Environmental sustainability. Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO4: Students will get knowledge about food preservation techniques
CO7: The students will know about the refrigration system.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **VI**

Course Type **:** Major

Course Code : FTR-352-MJM

Course Title **:** Plant Design and Layout

No.of Credits **: 02**

No. of Teaching Hours **:** 30

Course Objectives:

1. To learn about the importance of food safety
2. To study the different types of hazards
3. To study the morphology of different microorganisms.
4. To study about the factors affecting the growth of micro-organisms.
5. To learn about important microorganisms used in food processing industry.
6. To learn about accreditation and auditing.
7. To get knowledge about the growth curve.

Course Outcomes:

CO1: Students will get knowledge about the importance of food safety and morphology of micro-organisms.
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.
CO3: The students will know the important microorganisms used in food processing industry.
CO4: Student will learn about the different types of hazards
CO5: Students will get knowledge about accreditation and auditing
CO6 Students will learn about important microorganisms used in food processing industry.
CO7: Students will learn about growth curve.

Topics and Learning Points

Unit-I: Introduction to Plant Design **7 Periods**
Objectives of plant design.

Types of food processing plants.
Plant location – factors affecting location.
Plant site selection criteria.
Project planning and feasibility studies.

Unit-II: Plant Layout Principles **8 Periods**

Definition and importance of plant layout.
Types of plant layout (product, process, fixed position, combination).
Factors influencing plant layout.
Flow diagrams and plant layout drawings.
Relationship between layout and production efficiency.

Unit-III Design of Processing Sections **7 Periods**

Raw material receiving and storage.
Processing area – equipment arrangement and process flow.
Packaging, storage and dispatch section.
Service areas – laboratories, workshops, administration, amenities.
Material handling equipment and systems.

Unit-IV Utilities and Waste Management **8 Periods**

Water supply systems, steam, refrigeration, compressed air, power.
Drainage and waste disposal systems.
Sanitation, hygiene and safety in plant design.
Fire protection and emergency planning.
Green building and sustainability concepts

References:

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Plant Design and Layout
Course Type: Major Course Code: FTR-353-MJM

Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	6	-	-	-	-	-	-	-	2	2	-	-
CO2	-	-	2	6	5	6	6	-	-	-	-	6
CO3	-	-	-	-	-	-	-	-	-	-	-	2
CO4	-	2	-	-	2	-	-	4	-	-	6	-
CO5	-	-	2	-	2	2	-	2	-	2	-	-
CO6	4	-	-	-	2	-	-	-	-	2	-	-
CO7	2	-	1	4	2	6	-	-	-	-	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Students will get knowledge about the importance of food safety and the morphology of micro-organisms.
CO6 Students will learn about important microorganisms used in food processing industry.
CO7: Students will learn about growth curve.

PO2 Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: Student will learn about the different types of hazards

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.
CO5: Students will get knowledge about accreditation and auditing
CO7: Students will learn about growth curve.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO1: Students will get knowledge about the importance of food safety and morphology of micro-organisms.
CO7: Students will learn about growth curve.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.
CO4: Student will learn about the different types of hazards
CO5: Students will get knowledge about accreditation and auditing
CO6 Students will learn about important microorganisms used in food processing industry.
CO7: Students will learn about growth curve.

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.
CO5: Students will get knowledge about accreditation and auditing
CO7: Students will learn about growth curve.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO4: Student will learn about the different types of hazards
CO5: Students will get knowledge about accreditation and auditing

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO1: Students will get knowledge about the importance of food safety and morphology of micro-organisms.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Students will get knowledge about the importance of food safety and morphology of micro-organisms.
CO5: Students will get knowledge about accreditation and auditing
CO6 Students will learn about important microorganisms used in food processing industry.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: Student will learn about the different types of hazards

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO2: Students will have a thorough understanding of various factors responsible for food spoilage.
CO3: The students will know the important microorganisms used in food processing industry.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** Major

Course Code **:** FTR-354-MJM

Course Title **:** Practical of Animal Product Technology

No. of Credits **:02**

No. of Teaching Hours **30**

Course Objectives:

1. To learn about the basic laboratory safety practices.
2. To learn about maintaining personnel hygiene in food processing area.
3. To study the safety measures of laboratory instruments, material & glasswares.
4. To study the safety measures of various laboratory chemicals.
5. To learn importance of sanitation and sterilization in food preparation.
6. To study important microorganisms in food.
7. To study quality analysis of water.

Course Outcomes:

CO1: Students will get knowledge about the safety laboratory practices.
CO2: Students will learn about safety measures of various laboratory chemicals.

CO3: Students will have a thorough understanding of different microorganisms.
CO4: The students will know the cultivation of microbes by using various food samples.
CO5: Student will learn about importance of surface sanitation.
CO6: Students will learn about morphology of bacteria.
CO7: The students will know about the quality analysis of water.

Topics and Learning Points

Sr. No.	Title of Practical	Credits
1.	Estimation of moisture content of meat	2P
2.	Estimation of protein content of meat by Micro-kjedahl Method	2P
3.	To study shelf-life of the eggs.	2P
4.	Candling and grading of eggs	2P
5.	To study the canning of meat.	2P
6.	Egg pickle production.	2P
7.	To the study the slaughtering of Animals	2P
8.	Determination of physico-chemical quality of meat and meat products.	2P
9.	Introduction to the product formulation.	2P
10.	Quality evaluation of fish and prawns.	2P

References:

1. Manay S.N. and Shadaksharaswamy M. (2001); Food facts and principles, 2nd edn, New Age International (P) limited publishers.
2. Potter N. N. and Hotchkiss J.H. (1966); Food Science, 5th edn., CBS Publishers and distributors.
3. Y.H. Huiet at (2001) Meat Science & Applications, Marcel Dekker Inc.
4. NIIR Board; Preservation of Meat and Poultry Products, 1st, Asia Pacific Business Press Inc.
5. Stadelman W.J. and Cotterill O.J. (1973); Egg Science & Technology, 1st, The AVI Publishing Company, Inc.

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Practical of Animal Product Technology
Course Type: Major Course Code: FTR-354-MJM
Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	3	3	-	-
CO2	1	1	-	-	-	3	-	-	-	1	3	-
CO3	-	1	-	2	1	-	-	3	-	-	-	-
CO4	1	-	2	-	-	-	1	-	-	1	-	3
CO5	2	-	-	-	1	-	-	2	1	2	1	-
CO6	1	-	-	-	1	4	-	-	1	1	-	-
CO7	-	-	1	-	-	-	-	-	1	-	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Students will get knowledge about the safety laboratory practices.
CO6: Students will learn about morphology of bacteria.
CO7: The students will know about the quality analysis of water.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: The students will know the cultivation of microbes by using various food samples.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO2: Students will learn about safety measures of various laboratory chemicals.
CO5: Student will learn about importance of surface sanitation.
CO7: The students will know about the quality analysis of water.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO2: Students will learn about safety measures of various laboratory chemicals.
CO7: The students will know about the quality analysis of water.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO2: Students will learn about safety measures of various laboratory chemicals.
CO4: The students will know the cultivation of microbes by using various food samples.
CO5: Student will learn about importance of surface sanitation.
CO6: Students will learn about morphology of bacteria.
CO7: The students will know about the quality analysis of water.

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO2: Students will learn about safety measures of various laboratory chemicals.
CO5: Student will learn about importance of surface sanitation.
CO7: The students will know about the quality analysis of water.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO2: Students will learn about safety measures of various laboratory chemicals.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO4: The students will know the cultivation of microbes by using various food samples.
CO5: Student will learn about importance of surface sanitation.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO1: Students will get knowledge about the safety laboratory practices.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Students will get knowledge about the safety laboratory practices.
CO5: Student will learn about importance of surface sanitation.
CO6: Students will learn about morphology of bacteria.

PO11: Environmental sustainability. Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: The students will know the cultivation of microbes by using various food samples.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO2: Students will learn about safety measures of various laboratory chemicals.
CO3: Students will have a thorough understanding of different microorganisms.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme **:** B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** Major

Course Code **:** FTR-355-MJM

Course Title **:** Practical of Packaging Technology

No. of Credits **: 02**

No. of Teaching Hours **:** 30

Course Objectives:

1. To learn about the food groups
2. To study about the cooking methods
3. To know about working of various equipment used in food processing industries.
4. To get a knowledge about food preservation techniques.
5. To study about the history food processing technology.
6. To learn about the Scope & opportunities in food industries.
7. To study the refrigeration system

Course Outcomes:

CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO3: The students may know about working of various equipment used in food processing industries.
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.
CO7: The students will know about the advantages & disadvantages of cooking.

Topics and Learning Points

References:

1. Crosby NT.1981. *Food Packaging: Aspects of Analysis and Migration Contaminants*. App. Sci. Publ.
2. Kadoya T. (Ed). 1990. Food Packaging. Academic Press.
3. Mahadeviah M & Gowramma RV. 1996. *Food Packaging Materials*. Tata McGraw Hill.
4. Palling SJ. (Ed). 1980. *Developments in Food Packaging*. App. Sci. Publ.
5. Painy FA. 1992. *A Handbook of Food Packaging*. Blackie Academic.
6. Sacharow S & Griffin RC. 1980. *Principles of Food Packaging*. AVI Publ.
7. Stanley S & Roger CG.1970. *Food Packaging*. AVI Publ.
8. Gordon L. Robertson: Food Packaging- Principles and Practice Marcel Dekker Inc,USA (1993)
9. Donald Downing: Complete Course in Canning (3 Volumes) CTI Publications inc, USA (1996)
10. Mathlouthi M. (Editor): Food Packaging and Preservation Elsevier Applied Science Publications Essex, UK (1986)
11. J. R.D.David, R. H Graves and V.R. Carlson: Aseptic Processing and Packaging of Foods: CRC Press, New York

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc Subject: Practical of Packaging Technology

Course Type: Major Course Code: FTR-355-MJM

Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	3	3	-	-
CO2	1	1	-	-	-	3	-	-	-	1	3	-
CO3	-	1	-	2	1	-	-	3	-	-	-	-
CO4	1	-	2	-	-	-	1	-	-	1	-	3
CO5	2	-	-	-	1	-	-	2	1	2	1	-
CO6	1	-	-	-	1	4	-	-	1	1	-	-
CO7	-	-	1	-	-	-	-	-	1	-	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods
CO3: The students may know about working of various equipment used in food processing industries.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology.
CO4: Students will study about the history food processing technology.
CO7: The students will know about the advantages & disadvantages of cooking.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO3: The students may know about working of various equipment used in food processing industries.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO3: The students may know about working of various equipment used in food processing industries.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO6: Use of modern tools To operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO2: Student will study about the different cooking methods
CO6: Students will get knowledge about food preservation techniques.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO4: Students will study about the history food processing technology.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.

CO3: The students may know about working of various equipment used in food processing industries.
CO5: The students will learn about the Scope & opportunities in food industries.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO1: Student will learn about the food groups.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.
CO7: The students will know about the advantages & disadvantages of cooking.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Student will learn about the food groups.
CO2: Student will study about the different cooking methods
CO4: Students will study about the history food processing technology.
CO5: The students will learn about the Scope & opportunities in food industries.
CO6: Students will get knowledge about food preservation techniques.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO2: Student will study about the different cooking methods
CO5: The students will learn about the Scope & opportunities in food industries.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO4: Students will study about the history food processing technology.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme **:** B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** Major Elective

Course Code : FTR-356-MJE(A)

Course Title : **Meat Processing Technology**

No. of Credits : **02**

No. of Teaching Hours : 30

Course Objectives:

1. To make students aware about scope and opportunities in food processing sector.
2. To make students aware of different functions of food.
3. To make students aware about role of various food groups human diet.
4. To make students understand the nutritive value of foods.
5. To make student understand basic principles of cooking and its effect on different foods.
6. To study about the composition of different food groups.
7. To study about Toxins present in foods and its elimination.

Course Outcomes:

CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

Topics and Learning Points

Unit-1: Introduction **07 Periods**

Sources of Meat and Meat Products in India, it's important in National Economy
Meat: Definition of Meat, Classification, Structural and Composition of meat, Nutritive value of meat**.**

Unit-2: Slaughtering and Meat Handling **08 Periods**

Slaughtering of animals: Pre-slaughter transport and care and anti-mortem inspection, post-mortem inspection and grading of meat, Pre and post slaughter operations,
Processing and preservation of meat: Aging or chilling, freezing, pickling, curing, cooking and smoking of meat.

Unit-3: **08 Periods**

Meat tenderization, gelation preparation, principles of mea t preservation : refrigeration, freezing, dehydration, curing, smoking, and canning.
Comminutes meat products: Sausages, patties, Nuggets, kebabs, etc

Unit -4: **07 Periods**

By-products utilization and waste management in meat industry.
Packaging materials and techniques for fresh, frozen and processed meat.
Microbiology of meat and meat products.
GMP, GHP, HACCP in meat plants.
National and international regulations (FSSAI, BIS, Codex, OIE, OIE standards)
Labelling and traceability .

References:

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Meat Processing Technology
Course Type: Major Course Code: FTR-356-MJE(A)
Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	P O6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	2	-	-
CO2	2	-	-	2	2	-	2	-	-	2	-	5
CO3	2	-	-	6	-	6	2	2	-	4	-	-
CO4	1	3	3	2	-	5	-	-	-	2	-	-
CO5	-	-	-	6	6	5	4	2	-	2	-	2
CO6	1	-	2	4	3	6	5	-	-	2	3	-

CO7	-	-	**3**	**6**	-	**7**	**5**	-	**2**	**4**	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 6: To study about the composition of different food groups.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO 4: To make students understand the nutritive value of foods.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO 4: To make students understand the nutritive value of foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups' in human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.

PO6: Use of modern tools operates modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO 3: To make students aware about role of various food groups in human diet.
CO 4: To make students understand the nutritive value of foods.

CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups in human diet.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO8: Application of knowledge develop a scientific outlook and apply the knowledge with respect to food technology.
CO 3: To make students aware about role of various food groups in human diet.
CO 5: To make student understand basic principles of cooking and its effect on different foods.

PO9: Ethical awareness To train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO 7: To study about Toxins present in foods and its elimination.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO 11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO 6: To study about the composition of different food groups.

PO 12 Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO 2: To make students aware of different functions of food.
CO 5: To make student understand basic principles of cooking and its effect on different foods.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2025 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** F.Y B.Voc.

Semester **: VI**

Course Type **:** Major Elective

Course Code **:** FTR-356-MJE (B)

Course Title **: Fish Processing Technology**

No. of Credits **: 02**

Course Objectives:

No. of Teaching Hours **:** 3

1. To make students aware about scope and opportunities in food processing sector.
2. To make students aware of different functions of food.
3. To make students aware about role of various food groups human diet.
4. To make students understand the nutritive value of foods.
5. To make student understand basic principles of cooking and its effect on different foods.
6. To study about the composition of different food groups.
7. To study about Toxins present in foods and its elimination.

Course Outcomes:

CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

Topics and Learning Points

Unit I: Introduction to Fish Science
Overview of fish industry in India and world
Classification of fish (freshwater, marine, shellfish)
Anatomy and composition of fish and shellfish
Nutritional importance of fishery products
Seasonality and catch practices

Unit II: Handling and Chilling of Fish
Post-harvest handling of fish on board and on shore
Icing and cold storage methods
Transportation and marketing chain
Rigor mortis and biochemical changes in fish after catch
Spoilage mechanisms (microbial, enzymatic, oxidative)

Unit III: Preservation of Fish
Freezing, chilling, and cold chain maintenance
Drying and salting methods (traditional and modern)
Curing, smoking, pickling, fermentation
Modified atmosphere packaging and shelf life extension

Unit IV: Processing of Fish and Shellfish
Filleting, canning, mincing, surimi technology
Processing of prawns, shrimps, crab, mollusks
Production of value-added products (fish fingers, cutlets, fish balls, coated products)
By-products utilization (fish oil, fish meal, collagen, gelatin)
Sustainability and eco-labeling in fisheries

References:

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Fish Processing Technology
Course Type: Major Course Code: FTR-356-MJE(B)
Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	2	-	-	2	2	-	2	-	-	2	-	5

CO3	**2**	**-**	**-**	**6**	**-**	**6**	**2**	**2**	**-**	**4**	**-**	**-**
CO4	**1**	**3**	**3**	**2**	**-**	**5**	**-**	**-**	**-**	**2**	**-**	**-**
CO5	**-**	**-**	**-**	**6**	**6**	**5**	**4**	**2**	**-**	**-**	**-**	**2**
CO6	**1**	**-**	**2**	**4**	**3**	**6**	**5**	**-**	**-**	**2**	**3**	**-**
CO7	**-**	**-**	**3**	**6**	**-**	**7**	**5**	**-**	**2**	**4**	**-**	**-**

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 6: To study about the composition of different food groups.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO 4: To make students understand the nutritive value of foods.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO 4: To make students understand the nutritive value of foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO4: Analytical reasoning and problem solving to unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups in human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO 1: To make students aware about scope and opportunities in food processing sector.
CO 2: To make students aware of different functions of food.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO 3: To make students aware about role of various food groups human diet.
CO 4: To make students understand the nutritive value of foods.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups in human diet.
CO 5: To make student understand basic principles of cooking and its effect on different foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO8: Application of knowledge develops a scientific outlook and applies the knowledge with respect to food technology.
CO 3: To make students aware about role of various food groups human diet.
CO 5: To make student understand basic principles of cooking and its effect on different foods.

PSO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO 7: To study about Toxins present in foods and its elimination.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO 2: To make students aware of different functions of food.
CO 3: To make students aware about role of various food groups in human diet.
CO 4: To make students understand the nutritive value of foods.
CO 6: To study about the composition of different food groups.
CO 7: To study about Toxins present in foods and its elimination.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO 6: To study about the composition of different food groups.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO 2: To make students aware of different functions of food.
CO 5: To make student understand basic principles of cooking and its effect on different foods.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** Major Elective

Course Code **:** FTR-356-MJE (C)

Course Title **:** Poultry Processing Technology

No. of Credits **: 02**

No. of Teaching Hours **: 30**

Course Objectives:

1. To learn about the scope of Food Preservation of India
2. To study the functions of food
3. To study about the Indian Standards & International Organization.
4. To learn about energy metabolism & balance diet.

Course Outcomes:

CO1: Students will get knowledge about the food science & technology.
CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO3: The students will know the classification & health benefits of food.
CO4: Student will learn about the basic of nutrients.
CO5: Students will learn about various regulations related to food science.
CO6: Students will learn about various laws related to food science.
CO7: Students will get knowledge about food processing technology.

Topics and Learning Points

Unit-I: Introduction to Poultry Industry **07 Periods**

Overview of Indian and global poultry sector
Poultry species used for meat and egg production
Poultry anatomy and carcass composition
Nutritional value of poultry meat and eggs
Factors affecting meat quality (pH, color, tenderness, flavor, WHC)

Unit-II: Slaughtering and Dressing **07 Periods**

Ante-mortem inspection and handling of live birds
Stunning, bleeding, scalding, defeathering, evisceration
Post-mortem inspection
Chilling and packaging of dressed birds
By-products utilization (feathers, blood, offal)

Unit-III: Poultry Meat Preservation **08Periods**

Refrigeration, chilling and freezing methods
Curing, smoking, marination techniques
Modified atmosphere and vacuum packaging
Shelf-life extension technologies

Unit-IV: Processing of Poultry Meat Products **08 Periods**

Egg Handling and Processing
Egg structure, composition and grading
Cleaning, washing and preservation of shell eggs
Liquid egg, frozen egg, dried egg products
Value-added egg products and packaging

References:

- Food Facts & Principles – N. Shakuntala Manay, M. Shadaksharswamy
- Food Science – Sumati R. Mudambi, Shalini M. Rao, M.V.Rajagopal
- Essentials of Food Science – Vickie A. Vaclavik, Elizabeth W. Chrishtian
- Food Science (Vth edition) – Norman N. Potter and Joseph H. Hotchkiss (CSB Publishers)

Mapping of Programme Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Poultry Processing Technology
Course Type: Major Course Code: FTR-356-MJE(C)

Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	6	-	-	-	-	-	-	-	2	2	-	-
CO2	-	-	2	6	5	6	6	-	-	-	-	6
CO3	-	-	-	-	-	-	-	-	-	-	-	2
CO4	-	2	-	-	2	-	-	4	-	-	6	-
CO5	-	-	2	-	2	2	-	2	-	2	-	6
CO6	4	-	-	-	2	-	-	-	2	2	-	6
CO7	2	-	1	4	2	6	-	-	-	-	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: Students will get knowledge about the food science & technology.
CO6: Students will learn about various laws related to food science.
CO7: Students will get knowledge about food processing technology.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: Student will learn about the basic of nutrients.

PO3 Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO5: Students will learn about various regulations related to food science.
CO7: Students will get knowledge about food processing technology.

PO4: Analytical reasoning and problem solving to unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO7: Students will get knowledge about food processing technology.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.

CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO4: Student will learn about the basic of nutrients.
CO5: Students will learn about various regulations related to food science.
CO6: Students will learn about various laws related to food science.
CO7: Students will get knowledge about food processing technology.

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO5: Students will learn about various regulations related to food science.
CO7: Students will get knowledge about food processing technology.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO2: Students will have a thorough understanding of Indian Standards & International Organization.

PO8: Application of knowledge develop a scientific outlook and apply the knowledge with respect to food technology.
CO4: Student will learn about the basic of nutrients.
CO5: Students will learn about various regulations related to food science.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO6: Students will learn about various laws related to food science.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO1: Students will get knowledge about the food science & technology.
CO5: Students will learn about various regulations related to food science.
CO6: Students will learn about various laws related to food science.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: Student will learn about the basic of nutrients.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.

CO2: Students will have a thorough understanding of Indian Standards & International Organization.
CO3: The students will know the classification & health benefits of food.
CO5: Students will learn about various regulations related to food science.
CO6: Students will learn about various laws related to food science.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **VI**

Course Type **:** Minor

Course Code **:** FTR-361-MN

Course Title **:** Pulses and Oilseed Technology

No. of Credits **:02**

No. of Teaching Hours **30**

Course Objectives:

1 To make students aware about importance of presentation skills in food processing sector.
2 To make students aware about various equipments in artistic presentation of foods and their handling.
3 To make students aware about various utensils in artistic presentation of foods and their handling.
4 To make various products with different colours and shape to increase its attractiveness.
5 To make students prepare various desserts with attractive shape and colour.
6 To make students prepare various healthy and colourful soups.
7 To enhance students fruits and vegetable carving skills.

Course Outcomes:

CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colorful soups
CO7: To enhance student's fruits and vegetable carving skills.

Topics and Learning Points

Unit I: Introduction to Pulses and Oilseeds
Importance in Indian diet and economy.
Classification and varieties of pulses & oilseeds.
Chemical composition and nutritional significance.
Production scenario in India and globally.

Unit II : Major pulses & oilseeds
Major pulses: chickpea, pigeon pea, mung bean, urad, lentil, etc.
Major oilseeds: groundnut, soybean, mustard, sunflower, sesame, etc.

Unit III :Pulse Processing Technology and Oil Extraction and Processing
Pre-treatments: pitting, soaking, drying, dehusking, splitting.
Dal milling process and equipment.
Traditional and modern methods of oil extraction.
Expeller and solvent extraction principles.
Oil refining: degumming, neutralization, bleaching, deodorization.

Unit IV: Post-Harvest Handling and Storage
Cleaning, grading, drying of pulses and oilseeds.
Storage structures and pest control.
Losses during storage and prevention methods.
Quality standards and testing.

References:

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Pulses and Oilseed Technology
Course Type: Major Course Code: FTR-361-MN
Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	2	-	-	2	2	-	2	-	-	2	-	5
CO3	2	-	-	6	-	6	2	2	-	4	-	-
CO4	1	3	3	2	-	5	-	-	-	2	-	-
CO5	-	-	-	6	6	5	4	2	-	-	-	2
CO6	1	-	2	4	3	6	5	-	-	2	3	-
CO7	-	-	3	6	-	7	5	-	2	4	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: To make various products with different colours and shape to increase its attractiveness.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO4: To make various products with different colours and shape to increase its attractiveness.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.

CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.

CO7: To enhance students fruits and vegetable carving skills.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO6: To make students prepare various healthy and colorful soups
CO7: To enhance students fruits and vegetable carving skills.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO6: To make students prepare various healthy and colorful soups.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** Minor

Course Code **:** FTR-362-MN

Course Title **:**Practical of Pulses and Oilseed Technology

No. of Credits **: 02**

No. of Teaching Hours **: 30**

Course Objectives:

1 To make students aware about importance of presentation skills in food processing sector.
2 To make students aware about various equipments in artistic presentation of foods and their handling.
3 To make students aware about various utensils in artistic presentation of foods and their handling.
4 To make various products with different colours and shape to increase its attractiveness.
5 To make students prepare various desserts with attractive shape and colour.
6 To make students prepare various healthy and colourful soups.
7 To enhance students fruits and vegetable carving skills.

Course Outcomes:

CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colorful soups
CO7: To enhance student's fruits and vegetable carving skills.

Topics and Learning Points

Sr. No.	Title of Practical	Credits
1.	Identification and classification of major pulses and oilseeds.	2P
2.	Determination of moisture and oil content.	2P
3.	Cleaning, grading and dehulling operations.	2P
4.	Dal milling and recovery calculation.	2P
5.	Oil extraction using expeller and/or solvent extraction methods.	2P
6.	Refining of crude oil (lab scale).	2P
7.	Preparation of value-added pulse/oilseed products.	2P
8.	Quality evaluation (FFA, peroxide value, rancidity).	2P

9.	Visit to dal mill / oil extraction plant.	2P
10.	Record book and viva.	2P

References:

Mapping of Program Outcomes with Course Outcomes

Class: TY B.Voc. Subject: Practical of Pulses and Oilseed Technology
Course Type: Major Course Code: FTR-362-MN
Weightage: 0= No Relation, 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	2	-	-	2	2	-	2	-	-	2	-	5
CO3	2	-	-	6	-	6	2	2	-	4	-	-
CO4	1	3	3	2	-	5	-	-	-	2	-	-
CO5	-	-	-	6	6	5	4	2	-	-	-	2
CO6	1	-	2	4	3	6	5	-	-	2	3	-
CO7	-	-	3	6	-	7	5	-	2	4	-	-

Justification for the mapping

PO1: Disciplinary knowledge- Understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and Food technology & engineering and its other fields related to the program.
CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.

PO2: Communication Skills - Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
CO4: To make various products with different colours and shape to increase its attractiveness.

PO3: Critical Thinking- Propose novel idea sin explaining the scientific data, facts and figures related to science and technology**.**
CO4: To make various products with different colours and shape to increase its attractiveness.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO4: Analytical reasoning and problem solving To unable the students with good scientific and engineering knowledge so as to comprehend, design and create food products and devices for food industry and provide solutions for the challenges in the food industry as well as in the agriculture.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
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CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO5: Sense of Inquiry Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
CO1: To make students aware about importance of presentation skills in food processing sector.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups

PO6: Use of modern tools operate modern tools, equipment, instrument and laboratory techniques to perform the experiments and write the programmes in the different languages.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO7: Research skills Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to food technology.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.
CO6: To make students prepare various healthy and colourful soups
CO7: To enhance students fruits and vegetable carving skills.

PO8: Application of knowledge Develop a scientific outlook and apply the knowledge with respect to food technology.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.

PO9: Ethical awareness to train students in professional and ethical attitude, effective communication skills, team work skills, and multidisciplinary approaches related to food technology and engineering.
CO7: To enhance students fruits and vegetable carving skills.

PO10: Team Work understand the basic concepts, fundamental principles and experimental findings and the scientific theories related to food technology, food science and food technology and engineering and its other fields related to the programme.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO3: To make students aware about various utensils in artistic presentation of foods and their handling.
CO4: To make various products with different colours and shape to increase its attractiveness.
CO6: To make students prepare various healthy and colorful soups
CO7: To enhance students fruits and vegetable carving skills.

PO11: Environmental sustainability Develop various communication skills such and reading, listening and speaking skills to express ideas and views clearly and effectively.
CO6: To make students prepare various healthy and colorful soups.

PO12: Lifelong learning Propose novel ideas in explain the scientific data, fact and figures related to science and technology.
CO2: To make students aware about various equipments in artistic presentation of foods and their handling.
CO5: To make students prepare various desserts with attractive shape and colour.

CBCS Syllabus as per NEP 2020 for T.Y B.Voc. Food Technology & Research (2023 Pattern)

Name of the Programme: B.Voc. Food Technology & Research

Programme Code **:** FTR

Class **:** T.Y B.Voc.

Semester **: VI**

Course Type **:** OJT

Course Code **:** FTR-385-OJT

Course Title **:** On Job Training

No. of Credits **: 02**

No. of Teaching Hours **: 30**