



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

F. Y. B. Voc. (Food Processing and Post Harvest Technology)

For Department of Food Technology and Research

Choice Based Credit System Syllabus

(2025 Pattern)

(As Per NEP-2020)

To be implemented from Academic Year 2025-2026

**Title of the Programme: FY 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 steering 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), NCeR, 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	Sense of Inquiry	Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
PSO-6	Use of Modern Tools	Operate modern tools, equipment, instruments and laboratory techniques to 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	Application of Knowledge	Develop a scientific outlook and apply the knowledge with respect to food technology.
PSO-9	Ethical Awareness	To train students in professional and ethical attitude, effective communication skills, teamworkskillsandmultidisciplinaryapproachesrelatedtofoodtechnology and engineering.
PSO-10	Teamwork	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-11	Environment and Sustainability	Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
PSO-12	Lifelong Learning	Propose novel ideas in explaining the scientific data, facts and figures related to science and technology.

Anekant Education Society's
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. Bhosale Pallavi A. Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
5.	Ms. Shinde Soudamini S. Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
6.	Ms. Gaikwad Vaishnavi A. Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
7.	Ms. Gawade Prajakta A. Assistant Professor, Department of Food Technology and Research, T. C. College, Baramati	Member
8.	Ms. Aarti Dongare Assistant Professor, M.Sc. Food Science & Technology	Vice-Chancellor Nominee Subject Expert from SPPU, Pune
9.	Mr. Gatade Abhijeet Assistant Professor, Shivaji University, Kolhapur	Subject Expert from Outside the Parent University
10.	Mr. Pathan Fayaz L. Associate Professor, MIT-ADT University	Subject Expert from Outside the Parent University

11.	Mr. Gawate Dadasaheb Director, Di-Roma Ice-cream, Ahmad Nagar	Representative from industry/corporate sector/allied areas
12.	Mr. Vairagal Dnyaneshwar Schreiber Dynamix Pvt. Ltd. Baramati	Member of the College Alumni
13.	Ms. Vhora Payal	UG Student
14.	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 NCRT :

- 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.

Level / Difficulty	Sem	Subject-1			Subject-2	Subject-3	GE/OE	SEC	IKS	AEC	VEC	CC	Total	
4.5 / 100	I	2 (T) + 2 (P)			2(T)+2(P)	2(T)+2 (P)	2 (T)	2 (T/P)	2 (T) (Generic)	2 (T)	2	--	22	
	II	2 (T) + 2 (P)			2(T)+2(P)	2(T)+2 (P)	2 (P)	2 (T/P)	--	2 (T)	2	2	22	
Exit option: Award of UG Certificate in Major with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
Continue option: Student will select one subject among the (subject 1, subject 2 and subject 3) as major and another as minor and third subject will be dropped.														
Level / Difficulty	Sem	Credits Related to Major				Minor	GE/OE	SEC	IKS	AEC	VEC	CC	Total	
		Major Core	Major Electiv	VSC	FP / OJT/ CEP									
5.0 / 200	III	4 (T) + 2 (P)	--	2 (P)	2 (OJT)	2(T)+2(P)	--	2 (T)	--	2 (T) (Major Subject Specific)	2 (T)	--	2	22
	IV	4 (T) + 2 (P)	--	2 (P)	2 (OJT)	2(T)+2(P)	--	2 (P)	2 (T/P)	--	2 (T)	--	2	22
Exit option: Award of UG Diploma in Major and Minor with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
5.5 / 300	V	8(T) + 4(P)	2 (T) + 2 (P)	2 (P)	2 (OJT)	2(T)	--	--	--	--	--	--	--	22
	VI	8(T) + 4(P)	2 (T) + 2 (P)	2 (P)	4 (OJT)	--	--	--	--	--	--	--	--	22
Total 3 Years		44	8	8	10	18	8	8	6	4	8	4	6	132
Exit option: Award of UG Degree in Major with 132 credits OR Continue with Major and Minor														
6.0 / 400	VII	6 (T) + 4 (P)	2 (T) + 2 (T/P)	--	4 (OJT)	4(RM)(T)	--	--	--	--	--	--	--	22
	VIII	6 (T) + 4 (P)	2 (T) + 2 (T/P)	--	8 (OJT)	0		0	0	0	0	0	0	22
Total 4 Years		64	16	8	22	22	8	8	6	4	8	4	6	176
Four Year U/G Honours with Research Degree in Major and Minor with 176 credits OR														
6.0 / 400	VII	10(T) + 4(P)	2 (T) + 2 (T/P)	0	0	4 (RM) (T)			0	0	0	0	0	22
	VIII	10(T) + 4(P)	2 (T) + 2 (T/P)	0	4 (OJT)	0			0	0	0	0	0	22
Total 4 Years		72	16	8	14	22	8	8	6	4	8	4	6	176
Four Year UG Honours Degree in Major and Minor with 176 credits														

- 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 F. Y. B. Voc. (Food Technology) 2025-2026

Sem	Course Type	Course Code	Course Name	Theory / Practical	Credits
I	DSC-I (General)	FTR-101-GEN	Food Processing Technology	Theory	02
		FTR-102- GEN	Practical of Food Processing Technology	Practical	02
	DSC-II (General)	FTR-103- GEN	Food Safety Quality Management	Theory	02
		FTR-104- GEN	Practical Food Safety and Quality Management	Practical	02
	DSC-III (General)	FTR-105- GEN	Food Science-I	Theory	02
		FTR-106- GEN	Practical of Food Science-I	Practical	02
	Open Elective(OE)	FTR-107-OE	Basics of Food Science	Theory	02
	Skill Enhancement Course(SEC)	FTR-108-SEC	Culinary Arts	Practical	02
	Indian Knowledge System	FTR-109-IKS	Generic	Theory	02
	Ability Enhancement Course(AEC)	ENG-110-AEC	Functional English-I	Theory	02
	Value Education Course(VEC)	COS-111-VEC	Environmental Education	Theory	02
	Total Credits Semester-I-22				
II	DSC-I (General)	FTR-151- GEN	Preservation of Fruits and Vegetables	Theory	02
		FTR-152- GEN	Practical of Preservation of Fruits and Vegetables	Practical	02
	DSC-II (General)	FTR-153- GEN	Food Adulteration	Theory	02
		FTR-154- GEN	Practical of Food Adulteration	Practical	02
	DSC-III (General)	FTR-155- GEN	Food Science-II	Theory	02
		FTR-156- GEN	Practical of Food Science-II	Practical	02
	Open Elective(OE)	FTR-157-OE	Dairy Product Technology	Practical	02
	Skill Enhancement Course(SEC)	FTR-158-SEC	Traditional Indian Foods	Practical	02
	Ability Enhancement Course(AEC)	ENG-159-AEC	Functional English-II	Theory	02
	Value Education Course(VEC)	FTR-160-VEC	Digital & Technological Solutions	Practical	02
	Co-curricular Course (CC)	YOG/PES/CUL/NS S/NCC-161-CC	To be select from basket	Theory	02
	Total Credits Semester-II- 22				
Cumulative Credits Semester- I and II					44

**CBCS Syllabus as per NEP 2020 for F.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 : II****Course Type : DSC I General (T)****Course Code : FTR-151- GEN****Course Title : Preservation of Fruits and Vegetables****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 and Method of Preservation****10 Periods**

Importance of fruits and vegetable, history of food preservation and Canning Industry, Scope of Fruits & Vegetables Preservation in India, Principles of Preservation, Method of Preservation- Asepsis, Uses of high temperature, low temperature, chemical preservative, Drying, Filtration, Carbonation, Sugar, Fermentation, Salt, Acids, Oil and Spices (Natural Preservatives), Antibiotics and Irradiation.

Unit-2: Canning and bottling of fruits and vegetables**08 Period**

Principle and process of canning, Selection of fruits and vegetables, grading, washing, peeling, cutting, blanching, cooling, filling, exhausting, sealing, processing, cooling, storage containers used, bottling of fruits and vegetables, spoilage of canned foods, General consideration in establishing a commercial fruit and vegetable canning industry, Types and causes of Spoilage of canned foods.

Unit-3: Fruit and vegetable products**06 Period**

Unfermented and Fermented fruit beverages, Jam, Jelly and Marmalade, Preserve, Candied and Crystallized Fruits and Vegetables, Pickles, Chutneys and Sauces/Ketchups, Nectar, cordials, Fruit Cheese and Pectin.

Unit-4 Quality Control and Waste Utilization**06 Periods**

Quality Characteristics of Fruits and Vegetable for Processing, Quality Control in Food Processing Industry, utilization of Fruit and Vegetable waste, water for Fruit and Vegetable Processing Industries.

References:

1. Subbulakshi G ,Udapi shobha A, (2001) ,food processing and preservation , New age international (P) limited , publisher
2. Srivastava R.P, Kumar Sanjeev (1994) ,Fruits and vegetable preservation , first edition ,International book distributing co.
3. S. Ranganna (1977) ,Handbook of Analysis and quality control for fruit and vegetable products (second edition) ,Tata Mcgraw –hill publishing co. limited
4. Loesecke H.W.V. (2005), Drying and dehydration of foods, Updesh purohit for agrobios (India) jodhpur.
5. S. Saraswathy , T.L.preethi , S.Balsubramanyan , J.suresh ,N. Revanthi and S. naarajan (2008) : Post harvest Management of Horticulture Crops , Dr, Updesh
6. Purohit for Agrobios (India) Jodhpur Salunkhe D.K, Kadam S.S(2005) ,Handbook of fruit science and technology ,Marcel dekker, Inc.
7. Bose T.k ,Mitra S.K ,Sanyal D (2001) , Fruits : Tropical and subtropical (vol .1), Third edition ,Partha sankar basu naya udyog.
Bhatiya Vijaya (2004),Preservation of fruit and vegetables, 2nd edition, Kalyani publishers

Mapping of Program Outcomes with Course Outcomes

Class: F.Y B. Voc.

Subject: Food Processing and PHT

Course: Preservation of Fruits and Vegetables

Course Code: FTR-151- GEN

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 enable 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 (2025 Pattern)

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

Programme Code : FTR

Class	: F.Y B. Voc.
Semester	: II
Course Type	: DSC-II General (P)
Course Code	: FTR-152- GEN
Course Title	: Practical of Preservation of Fruits and Vegetables
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 knowledge about 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 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 refrigeration system.

Topics and Learning Points

Sr No.	Title of the Practical	Periods
1	Maturity analysis of fruits (sensory, chemical, etc	2P
2	Preparation of Jam	2P
3	Preparation of Jelly	2 P
4	Preparation of Marmalade	2 P
5	Preparation of Nectar	2P

6	Preparation of Cordial	2P
7	Preparation of RTS	2P
8	Preparation of Squash	2 P
9	Preservation by Salt: A. Preparation of Sauerkraut	2P
10	Preservation by Salt: B. Preparation of Pickles	2P
11	Preservation by High temperature: Canning of fruits and vegetables	2P
12	Preparation of fruit leather	2P
13	Preservation by use of acidulents: Preparation of Tomato products	2P
14	Visit to Fruit & Vegetable Processing Industries	2P

References:

1. Subbulakshi G, Udapi shobha A, (2001) ,food processing and preservation , New age international (P) limited , publisher
2. Srivastava R.P, Kumar Sanjeev (1994) ,Fruits and vegetable preservation , first edition ,International book distributing co.
3. S. Rangna (1977) ,Handbook of Analysis and quality control for fruit and vegetable products (second edition) ,Tata Mcgraw –hill publishing co. limited
4. Loesecke H.W.V. (2005), Drying and dehydration of foods, Updesh purohit for agrobios (India) jodhpur.
5. S. Saraswathy , T.L.preethi , S.Balsubramanyan , J.suresh ,N. Revanthy and S. naarajan (2008) : Post harvest Management of Horticulture Crops , Dr, Updesh
6. Purohit for Agrobios (India) Jodhpur Salunkhe D.K, Kadam S.S(2005) ,Handbook of fruit science and technology ,Marcel dekker, Inc.
7. Bose T.k ,Mitra S.K ,Sanyal D (2001) , Fruits : Tropical and subtropical (vol .1), Third edition ,Partha sankar basu naya udyog.
Bhatiya Vijaya (2004),Preservation of fruit and vegetables, 2nd edition, Kalyani publishers

Mapping of Program Outcomes with Course Outcomes

Class: FY B.Voc.

Subject: Food Processing and PHT

Course: Practicals of Preservation of Fruits and Vegetables

Course Code: FTR-152- GEN

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 enable 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 refrigeration 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 refrigeration 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 refrigeration 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 refrigeration 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 refrigeration 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 refrigeration system.

CBCS Syllabus as per NEP 2020 for F.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 : II

Course Type : DSC-II (General) (T)

Course Code : FTR-153-GEN

Course Title : Food Adulteration

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-Common Foods and Adulteration:

Common Foods subjected to Adulteration - Adulteration - Definition - Types; Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives - Intentional and incidental. General Impact on Human Health.

UNIT-II:- Adulteration of Common Foods and Methods of Detection: (10hrs)

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices and condiments, Processed food, Fruits and vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III:- Present Laws and Procedures on Adulteration:

Highlights of Food Safety and Standards Act 2006 (FSSA) Food Safety and Standards Authority of India-Rules and Procedures of Local Authorities.

Role of voluntary agencies such as, Agmark, I.S.I.

UNIT-IV :- Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives.

Consumer education, Consumer's problems rights and responsibilities, COPRA 2019 - Offenses and Penalties - Procedures to Complain - Compensation to Victims.

References:

- Food microbiology (IVth edition) - William C. Frazier and Dennis C. Westoff- Tata McGraw Hill Pub. Co. Ltd, New Delhi, 1995)
- Basic food microbiology-George G. Banwart (CBS publishers & distributors, New Delhi, 1987)
- Food microbiology- M. R. Adams & M. O. Moss (New Age International (P). Ltd. 2000)
- Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000

Mapping of Program Outcomes with Course Outcomes

Class: FY B.Voc.

Subject: Food Processing and PHT

Course: Food Adulteration

Course Code: FTR-153- GEN

Weightage: 0= No Relation, 1= Weak or low relation, 3= Strong or direct relation.

2= Moderate or partial 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 enable 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 as 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 F.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 II

Course Type : DSC-II (General) (P)

Course Code : FTR-104-GEN

Course Title : Practicals of Food Adulteration

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	Detection of water and added skim milk in milk	2P
2	Detection of hydrogen peroxide/bleach or added detergents in milk	1P
3	Detection of starch in milk and other dairy products	1P
4	Detection of urea and added salts in milk	1P
5	Detection of vegetable fat (vanaspati) in ghee/butter	1P
6	Detection of argemone oil in edible oils	1P
7	Detection of reused (degraded) cooking oil	1P
8	Detection of Chicory in coffee and other fillers	1P
9	Detection of artificial colors/dyes in spices and sweets	1P
10	Detection of metanil yellow or Sudan dyes in turmeric/chili powder	1P
11	Detection of starch/chalk (calcium carbonate) in spices and sugar	1P
12	Detection of papaya seeds or stone/pith in black pepper and other spices	1P
13	Detection of wheat flour adulterants (alum, ferrous sulfate, bran)	1P
14	Detection of sugar adulteration (glucose, starch, chalk)	1P
15	Detection of synthetic honey or added sugar in honey	1P

References:

- Food microbiology (IVth edition) - William C. Frazier and Dennis C. Westoff- Tata McGraw Hill Pub. Co. Ltd, New Delhi, 1995)
- Basic food microbiology-George G. Banwart (CBS publishers & distributors, New Delhi, 1987)
- Food microbiology- M. R. Adams & M. O. Moss (New Age International (P). Ltd. 2000)
- Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- Introduction to Microbiology, M.H.Gajbhiye & S.J. Sathe et al, Career Publications, Nashik, 2015.

Mapping of Program Outcomes with Course Outcomes

Class: FY B.Voc.

Course: Practicals of Food Adulteration

Subject: Food Processing and PHT

Course Code: FTR-154- GEN

Weightage: 0= No Relation,
3= Strong or direct relation.

1= Weak or low relation,

2= Moderate or partial 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 enable 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 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.

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 F.Y B. Voc. Food Technology & Research

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

Programme Code : FTR

Class : F.Y B. Voc.

Semester : II

Course Type : DSC-III General (T)

Course Code : FTR-155-GEN

Course Title : Food Science-II

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 Milk & Milk Products

08 Periods

Composition & Nutritive value, physical properties, Milk cookery, White revolution, Milk substitute, Role of milk & milk products in cookery.

Unit-2 Sugar & Related Products

06 Periods

Nutritive value, Properties, types, Characteristics & uses of sugar, sugar cookery & role of sugar in cookery, Sugar related products, Artificial sweeteners.

Unit -3 Fats & Oils

05 Periods

Composition & Nutritive value, Specific fats & Oils, Effect of heating, role of fat or oil in cookery.

Unit 4 Egg and Flesh foods

06 Periods

Egg: Structure of egg, composition & nutritive value, Egg cookery, role of egg in cookery.

Flesh Foods: Composition, nutritive value and cookery of meat, poultry & fish.

Unit 5 Beverages & appetizers

05 Periods

Classification - Coffee, Tea, Cocoa and its processing, introduction to other beverages.

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 and Distributors, New Delhi, 1996)

Mapping of Program Outcomes with Course Outcomes

Class: FY B.Voc.

Subject: Food Processing and PHT

Course: Food Science II

Course Code: FTR-155- GEN

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 enable 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 F.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 II

Course Type : DSC-II GEN (P)

Course Code : FTR-106-MJM

Course Title : Practicals of Food Science-II

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

Sr. No.	Title of the practicals	Credits
1.	Introduction to Healthy and Nutritious food products	2P
2.	Study of role of Nutrients in Human diet	1P
3.	Preparation of protein rich foods	1P
4.	Preparation of malt	1P
5.	Preparation of green leafy vegetables soup	1P
6.	Preparation of Masala tea	1P
7.	Determination of pH	1P
8.	Determination of TSS	1P
9.	Determination of water absorption capacity of flour	1P
10.	Preparation of Onion powder	1P
11.	Preparation of RTS	1P
12.	Preparation of Garlic powder	1P
13.	Study of sensory evaluation of foods	1P
14.	Study of role of various nutrients in infant food	1P
15.	Study tour	1P

References:

1. Food Science By Potter
2. Food Science 3rd edition By B. Shrilakshmi
3. Fruit & Vegetable Preservation By Srivastava Kumar
4. Food, Facts and Principles By Shakuntala Manay
5. Food Processing and Preservation By G. Subbulakshmi, Shobha A. Udipti
6. Food Processing Technology 2nd edition By P. J. Fellows

Mapping of Program Outcomes with Course Outcomes

Class: FY B.Voc.

Subject: Food Processing and PHT

Course: Practicals of Food science II

Course Code: FTR-155- GEN

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 enable 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 F.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 : II

Course Type : Open Elective (OE)

Course Code : FTR-157-OE

Course Title : Dairy product 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

Sr. No	Title of the practical	Periods
1.	Physical examination of milk	2P
2.	Platform tests of milk	1P
3.	Detection of adulteration of milk	2P
4.	Testing of milk for acidity	1P
5.	Specific gravity of milk	1P
6.	Preparation of Dahi	1P
7.	To determine protein content in milk.	2P
8.	Preparation of Lassi	1P
9.	To prepare casein and calculate its yield.	1P
10.	Preparation of Basundi.	1P
11.	Preparation of Khoa	1P
12.	Preparation of Gulabjamun.	1P
13.	Preparation of Paneer	1P
14.	Preparation of Rasgulla	2P

References:

1. De Sukumar, Outlines of Dairy Technology, Oxford University Press, Oxford. 2007
2. Robinson, R.K. (2 vol. set). 1986. Modern Dairy Technology. Elsevier Applied Science, UK.
3. Warner, J.M. 1976. Principles of Dairy Processing. Wiley Eastern Ltd., New Delhi.

4. Yarpar, W.J. and Hall, C.W. 1975. Dairy Technology and Engineering. AVI, Westport.

5. Rosenmal, I. 1991. Milk and Milk Products. VCH. New York.

Webb and Johnson, Fundamentals of Dairy Chemistry

Mapping of Program Outcomes with Course Outcomes

Class: F. Y. B. Voc.

Subject: Food Processing and

PHT Course: Dairy Product Technology

Course Code: FTR-157- OE

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 enable 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 F. Y. B. Voc. Food Technology & Research

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

Programme Code : FTR

Class : F.Y B.Voc.

Semester : II

Course Type : Skill Enhancement Course (SEC)

Course Code : FTR-158-SEC

Course Title : Traditional Indian Foods

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.	Introduction to Indian traditional foods	2P
2.	Preparation of indian Traditional sweets	2P
3.	Preparation of Traditional fermented food product	2P
4.	Preparation of traditional beverage	2P
5.	Preparation of Multigrain chakli	2P
6.	Preparation of millet based traditional food product	2P
7.	Preparation of Traditional fruit and vegetable based product	2P
8.	Preparation of stuffed products	2P
9.	Preparation of convenience traditional food products	2P
10.	Preparation of nutritious millet product	2P
11.	Preparation of fermented product from grains	2P
12.	Preparation of	2P
13.	To study importance of traditional foods	2P
14.	To study Festival and products for particular indian festivals	2P
15.	Visit to any traditional or cultural heritage site	2P

References:

- The Food Lab: Better Home Cooking Through Science" by J. Kenji López-Alt
- On Food and Cooking: The Science and Lore of the Kitchen (Hardcover) by Harold McGee
- The Professional Chef by Culinary Institute of America.

Mapping of Program Outcomes with Course Outcomes

Class: FY B. Voc.

Subject: Food Processing and PHT

Course: Traditional Indian Foods

Course Code: FTR-158- SEC

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 in 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 enable 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 colorful 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 colorful 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.

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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.

Theory Paper No- ENG-181-AEC-Functional English - II

Maximum Marks: 30

Teaching Period: 2 /week

Credits: 2

Teaching Load: 30 Theory Period/Semester

Theory Paper No- FTR-185-VEC-Digital & Technological Solutions

Maximum Marks: 30

Teaching Period: 2/week

Credits: 2

Teaching Load: 30 Theory Period/Semester

Theory Paper No- 139-Co-curricular Course (CC)