

 Estd. 1962 "A++" Accredited by NAAC (2021) With CGPA 3.52	SHIVAJI UNIVERSITY, KOLHAPUR 416 004, MAHARASHTRA PHONE : EPABX - 2609000, BOS Section - 0231-2609094, 2609487 Web : www.unishivaji.ac.in Email: bos@unishivaji.ac.in शिवाजी विद्यापीठ, कोल्हापूर, ४१६ ००४, महाराष्ट्र दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४, २६०९४८७ वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in	 
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Ref.: SU/BOS /Voc. / 222

Date: 06 - 07- 2026

The Principal,
 All concerned Affiliated Colleges /Institutions,
 Shivaji University, Kolhapur

**Subject : Regarding Syllabi of B. Voc. Part II Programme under the Faculty of
 Inter- Disciplinary Studies as per National Education Policy 2020 (2.0)**

Sir/Madam,

With reference to the subject, mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi of following B. Voc. Part II Programme under the Faculty of Inter-Disciplinary Studies, as per National Education Policy 2020 (2.0).

1	B. Voc. Food Processing Technology	6	B Voc. Tourism And Service Industry
2	B. Voc Sustainable Agriculture	7	B. Voc. Building Technology & Interior Designing
3	B. Voc. Automobile	8	B. Voc. Printing And Publishing
4	B. Voc. Graphic & Design	9	B. Voc. Nutrition And Dietetics
5	B. Voc. Nursing And Hospital Management	10	B. Voc. Sustainable Agriculture Management

This syllabus (nature of question paper and equivalence etc) shall be implemented from the academic year **2026-2027** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in NEP-2020 (Online Syllabus).

The question papers on the pre-revised syllabi of above-mentioned programmes will be set for the examinations to be held in October /November 2026 & March/April 2027. These chances are available for repeater students, if any.

You are therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully



Dy Registrar

Encl. : as above

Copy to: For information and necessary action

1	The I/C Dean, Faculty of IDS	7	P.G.Admission Section
2	Director, Board of Examination and Evaluation	8	Affiliation T. 1 & T. 2 Section
3	The Chairman, Respective Board of Studies	9	Appointment A & B Section
4	All On Exam Section	10	P.G.Seminar Section
5	Eligibility Section	11	I. T. Cell
6	Computer Centre	12	Internal Quality Assurance Cell (IQAC)

SHIVAJI UNIVERSITY, KOLHAPUR



Accredited By NAAC with 'A++' Grade with CGPA 3.52

Structure and Syllabus in Accordance with

National Education Policy- 2020

With Multiple Entry and Multiple Exit

Faculty of Interdisciplinary Studies

Syllabus for

B. Voc.-Part II NEP-2.0

Food Processing Technology

Revised Syllabus to be implemented from Academic Year 2026-2027 onwards

(Subject to the modifications that will be made from time to time)

SHIVAJI UNIVERSITY, KOLHAPUR
Revised Syllabus for the Bachelor of Vocation in Food Processing Technology
(As per NEP- 2.0)
Applicable from the Academic Year 2026 – 27

1. **Title:** B. Voc. II Food Processing Technology Degree Programme, Shivaji University, Kolhapur Revised Syllabus as per NEP – 2.0
2. **Faculty:** Faculty of Food Processing Technology.
3. **Year of Implementation:** From June 2026

4. **Preamble (Food Processing Technology):** Food Processing Technology is an interdisciplinary field that integrates principles of science, engineering, and technology to transform raw agricultural produce into safe, nutritious, and value-added food products. With rapid advancements in the food industry and increasing global demand for quality and safe foods, this course aims to equip students with comprehensive knowledge and practical skills required to excel in various sectors of food processing, preservation, and management.

The curriculum is designed to provide a strong foundation in Food Science, Food Chemistry, and Food Microbiology, while emphasizing the principles of food preservation, post-harvest technology, and unit operations in food processing. Students gain hands-on expertise in specialized areas such as dairy, meat, poultry, fish, fruits and vegetables processing, bakery and confectionery, beverages, and fermentation technology.

The course also focuses on critical aspects of food safety, hygiene, sanitation, quality control, and regulatory frameworks, ensuring that students are prepared to uphold industry standards and comply with legal requirements. Through exposure to food analytical techniques, sensory evaluation, packaging technology, and waste management, students develop the competence to innovate, evaluate, and manage food products effectively.

The Food Processing Technology course prepares students for careers in food manufacturing, quality assurance, research and development, entrepreneurship, and allied sectors. It emphasizes practical training, problem-solving, and application of theoretical knowledge to real-world scenarios, thereby fostering skilled professionals capable of contributing to the sustainable growth and modernization of the food industry.

5. Program Outcomes:

- PO-1: - Students will gain a strong foundation in food science, food processing, preservation techniques, and quality control.
- PO-2: - Students will be able to identify and solve common problems related to food spoilage, processing errors, or equipment faults.
- PO-3: - Students will learn to handle food processing equipment and tools safely and effectively in real-life industrial or laboratory settings.
- PO-4: - Students will be able to work well in teams and communicate ideas clearly in both oral and written forms, especially in industrial and technical environments.
- PO-5: - Students will understand food safety standards like FSSAI, HACCP, and ISO, and how to apply them in processing and packaging.
- PO-6: - Students will be motivated to start their own food-related businesses and continue learning new technologies and trends in the food industry.

6. Course Outcomes (CO):

- CO-1: - Students will be able to understand nutrition, preservation, canning, spoilage, shelf-life improvement, and processing of fermented and unfermented fruit and vegetable products.
- CO-2: - Students will be able to assess food quality attributes such as colour, texture, flavour, viscosity,

and consistency using sensory and instrumental evaluation techniques.

- CO-3: - Students will be able to understand the structure, functions, and functional properties of carbohydrates, proteins, lipids, and vitamins, and relate biochemical changes to food processing and nutrition.
- CO-4: - Students will be able to perform basic food analysis using proximate analysis, colorimetry, spectrophotometry, electrophoresis, and chromatographic techniques for quality evaluation.
- CO-5: - Students will be able to explain milk composition, processing operations, and manufacture of major milk and milk products, along with sanitation and quality aspects in dairy industries.
- CO-6: - Students will be able to apply post-harvest handling, storage, and management practices to reduce losses and maintain quality of plant and animal-origin foods.
- CO-7: - Students will be able to implement food safety management systems, hygiene, and sanitation practices to ensure safe food production and compliance with food safety standards.

7. Objectives of a Bachelor of Vocation (B. Voc.) in Food Processing Technology Program include:

- Understand the fundamental principles, laws, concepts and formulas of Food Processing.
- Enhance employability and bridge the gap between education and industry needs
- Gain practical experience by hands-on experience with instruments and develop laboratory skills.
- Students benefit from practical, hands-on experience alongside their academic studies, leading to increased job readiness and a smoother transition into the workforce
- Learn about advanced Food Processing and its applications for higher studies.
- Learn to apply conceptual knowledge to practical work.
- Learn to interpret chemical and physical phenomena through experimental evidence.
- Learn to analyze and interpret data accurately through scientific reasoning and experimental hypothesis testing.

8. Duration of the Course: The B. Voc. II Course (Food Processing Technology) (Level 5.0) will be of **Two Semesters (Sem. II and Sem IV).**

9. Medium of Instruction: English

10. Eligibility for Admission to B. Voc. Part II (Level 5.0):

- i. The students passing or ATKT the B. Voc. Part-I (or Undergraduate Certificate in Food Processing Technology) shall be allowed to enter upon the B. Voc. Part-II (or Undergraduate Diploma in Food Processing Technology).

OR

- ii. An Examination of any other Statutory University or an examining Body recognized as equivalent there to.

11. Scheme of Teaching and Examination:

- i. Each theory course paper constitutes of 4-5 units, which require 30 hours of teaching lectures and there shall be two lectures per theory (2 Cr) course per week.
- ii. B. Voc. II Food Processing Technology Course will be of 44 Credits (1100 marks).
- iii. Examination of each **theory course** shall be of **50 marks** (30 university examination + 20 internal assessment). University examination of 30 marks (1.5 hours' duration) will be conducted at the end of each Semester. Internal assessment of 20 marks will be done before the semester examination during each semester.
- iv. Examination for a practical course shall be 50 marks per semester.
- v. Pattern and Nature, marking scheme for theory and Practical Examination for Major Specific SEC and VSC courses are included in syllabus.
- vi. Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus. Weightage should be provided for each unit as per the hours allotted for teaching.

12. Structure of course: Given in Framework Chart

13. Standard of Passing: The standard of passing shall be as per the following table.

	Semester End Exam	Internal Assessment	Course Exam (Total)
Maximum Marks	30	20	50
Minimum Marks required for passing	12	8	20

- i. There shall be a separate head of passing for semester-end examination and internal examination.
- ii. Minimum 20 marks out of 50 are required for passing of practical examination of each course.
- iii. **Assessment:** The NEP 2020 emphasizes upon formative and continuous assessment rather than summative assessment. Therefore, the scheme of assessment should have components of these two types of assessments. Assessment has to have correlations with the learning outcomes that are to be achieved by a student after completion of the course
 - a) **Continuous Assessment:** Assignments, projects, presentations, seminars and quizzes
 - b) **Examinations:** Midterm, finals, or comprehensive exams.
 - c) **Research Projects/Dissertation/Thesis:** Evaluated through submission and viva-voce
 - d) **Grading System:** Standardized letter grades, percentages, or CGPA

Letter Grades and Grade Points:

The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester. The SGPA is based on the grades of the current term, while the Cumulative GPA (CGPA) is based on the grades in all courses taken after joining the programme of study. The HEIs may also mention marks obtained in each course and a weighted average of marks based on marks obtained in all the semesters taken together for the benefit of students.

Computation of SGPA and CGPA: UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)	0
Ab (Absent)	0

1. The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a

student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\text{SGPA } (S_i) = \frac{\sum (C_{ix}G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i^{th} course and G_i is the grade point scored by the student in the i^{th} course.

2. The Cumulative Grade Point Average (CGPA) is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\text{CGPA} = \frac{\sum (C_{ix}S_i)}{\sum C_i}$$

Where S_i is the SGPA of the i^{th} semester and C_i is the total number of credits in that.

14. Nature of Question paper and scheme of marking:

- Theory question paper: Maximum marks -30
- Total No. of questions – 3
- All questions are compulsory.
- Question No.1 is MCQ type (6 Marks).
- Question number 2 is long answer type question Carries 12 marks.
- Question number 3 is short answer type question carries 12 marks.

(Nature of question paper is provided at the end of syllabus.)

SHIVAJI UNIVERSITY, KOLHAPUR

NEP 2.0: Credit Framework for B. Voc. Undergraduate (UG) Programme under Faculty of Interdisciplinary Studies

B. Voc. Food Processing Technology

Level	Semester	COURSES			OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP/ CC/ RP	Total Credit	Degree/Cum/Cr. MEME
		Course –I	Course -II	Course -III			IKS			
4.5	I	DSC-I (2) DSC-II (2) DSC P-I (2)	DSC-I (2) DSC-II (2) DSC P-I (2)	DSC-I (2) DSC-II (2) DSC P-I (2)	OE -1 (T/P) (2)	-	IKS-I (2) Introduction to IKS	-	22	UG Certificate 44
	II	DSC-III (2) DSC-IV (2) DSC P-II (2)	DSC – III (2) DSC-IV (2) DSC P-II (2)	DSC-III (2) DSC-IV (2) DSC P-II (2)	OE-2 (T/P) (2)	-	VEC-I (2) (Democracy, Election and constitution)	-	22	
Credits		8(T)+4(P)= 12	8(T)+4(P)= 12	8(T)+4(P)=12	2+2 =4	-	2 + 2= 4	-	44	Exit Option: 4 Credits NSQF/Internship/Skill Courses
		MAJOR		MINOR						
5.0	III	Major-V (2) Major-VI (2) Major P-III (2)	-	Minor-V (2) Minor-VI (2) Minor P-III (2)	OE -3 (T/P) (2)	VSC- I (2) (P) (Major Specific) SEC-I (2) (T/P)	AEC-I (2) English	CC-I (2)	22	UG Diploma 88
	IV	Major-VII (2) Major-VIII (2) Major P-IV (2)	-	Minor-VII (2) Minor-VIII (2) Minor P-IV (2)	OE-4 (T/P) (2)	SEC-II (2) (T/P)	AEC-II (2) English VEC-II (2) (Environmental Studies)	CEP-I (2)	22	
Credits		8(T)+4(P)= 12	-	8(T)+4(P)=12	2+2= 4 (T/P)	4 (T/P) +2 (P)=6	2 + 4= 6	2 + 2= 4	44	Exit Option: 4 Credits NSQF/Internship/Skill Courses
5.5	V	Major-IX (2) Major-X (2) Major P-V (4)	Major-I(ELEC) (2) Major P-I (ELEC) (2)	-	OE-5 (T/P) (2)	VSC-II (2) (Major Specific) (P)	AEC-III (2) English	OJT (4)	22	UG Degree 132
	VI	Major-XI (2) Major-XII (2) Major P-VI (4)	Major-II (ELEC) (2) Major P-II (ELEC) (2)	-	-	VSC-III (2) (P) (Major Specific) SEC-III (2) (T/P)	AEC-III (2) English IKS-2(Major Specific) (2)	FP (2)	22	
Credits		8 (T) + 8 (P) = 16	4 (T) + 4 (P) = 8	-	2 (T/P)	2 (T/P) +4 (P) = 6	2 + 4 = 6	4+2 = 6	44	
Total Credits		40+20=60		24	10	12	16	10	132	Exit Option

B. Voc. Food Processing Technology

Titles of Papers

Sem	Course	Code	Paper No.	Title of Paper
III	I	Major-V	B. Voc. Paper- V	Fruits and Vegetables Processing - I
		Major-VI	B. Voc. Paper- VI	Fruits and Vegetables Processing - II
		Major P-III	B. Voc. Practical –III	Based upon Major-V and Major-VI
	II	Minor-V	B. Voc. Paper- V	Food Quality and Sensory Evaluation
		Minor-VI	B. Voc. Paper- VI	Food Biochemistry
		Minor-P-III	B. Voc. Practical –III	Based upon Minor-V and Minor-VI
	OE -III	Open Elective	Practical (2)	Good Manufacturing Practices
	VSC-I	Vocational Skill Courses	Practical (2)	Vocational Skill Course in Fruits & Vegetable Processing
	SEC-I	Skill Enhancement Courses	Practical (2)	Sensory Evaluation Test
	AEC-I English	Ability Enhancement Courses	Theory (2)	English
	CC-I	Co-Curricular Courses	2 Cr	Yoga Education
IV	I	Major-VII	B. Voc. Paper- VII	Food Analytical Techniques
		Major-VIII	B. Voc. Paper- VIII	Dairy Technology
		Major P-IV	B. Voc. Practical –IV	Based upon Major-VII and Major-VIII
	II	Minor-VII	B. Voc. Paper- VII	Post Harvest Technology
		Minor-VIII	B. Voc. Paper- VIII	Food Safety, Hygiene and Sanitation
		Minor-P-IV	B. Voc. Practical –IV	Based upon Minor-VII and Minor-VIII
	OE -IV	Open Elective	Practical (2)	Food Machinery and Equipments
	SEC-II	Skill Enhancement Courses	Practical (2)	Food Acidity and pH Analysis
	AEC-II English	Ability Enhancement Courses	Theory (2)	English
	VEC-II	Value Education Courses	Theory (2)	Environmental Studies
	CEP-I	Community Engagement Programme	Theory (2)	Community Engagement Programme in Food Processing Technology

• Student Contact Hrs. Per week: 36 hrs.	• Total marks for B. Voc.- UG Diploma: 1100
• Theory and Practical Lectures: 60 Minutes Each	• Total credits for B. Voc.- UG Diploma: 44
• DSC: Discipline Specific Course	
• MAJOR: Mandatory/Elective	
• MINOR: Course may be from different disciplines of same faculty of DSC Major.	
• OE (Open Elective): Chosen compulsorily from faculty other than that of the Major.	
• VSC/SEC: Vocational Skill Courses (MAJOR related)/Skill Enhancement Courses	
• AEC/ VEC / IKS: Ability Enhancement Courses (English, Modern Indian Language)/Value Education Courses/ Indian Knowledge System (Generic & Specific))	
• OJT/FP/RP/CEP/CC: On-Job Training (Internship/Apprenticeship) / Field Project (Major related)/ Research Projects (Major related) Community Engagement (Major related)/ Co-Curricular Courses (CC) such as Health & Wellness, Yoga Education, Sport, and Fitness, Cultural activities, NSS/NCC and Fine /applied/visual/performing Arts / Vivek Vahini etc.	

Eligibility for Admission:

- i. The students passing or ATKT the B. Voc. Part-I (or Undergraduate Certificate in Food Processing Technology) shall be allowed to enter upon the B. Voc. Part-II (or Undergraduate Diploma in Food Processing Technology).
- OR
- ii. An Examination of any other Statutory University or an examining Body recognized as equivalent there to.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Major– V B. Voc. Paper-V

Fruits and Vegetables Processing - I

Theory: 30 Hours

(Credits: 02)

Unit–1: - Introduction to Fruits and Vegetables

(8 Hrs)

Importance of fruits and vegetables in human nutrition, Role of fruits and vegetables in balanced diet, Nutritional composition of fruits and vegetables, Importance of vegetable crops in India, Economic and industrial importance of fruits and vegetables

Unit–2: - Food Preservation

(7 Hrs)

Need and objectives of food preservation, causes of spoilage of fruits and vegetables, Principles of food preservation, Improving keeping quality of fruits and vegetables, post-harvest handling of fruits and vegetables

Unit–3: - Principles of Canning and Bottling

(7 Hrs)

Definition and importance of canning and bottling, Principle of canning, Process flow of canning, Selection of fruits and vegetables for canning, Grading and washing operations.

Unit–4: - Canning Operations and Spoilage

(8 Hrs)

Peeling, cutting, blanching and cooling, Filling, exhausting and sealing, Heat processing and cooling, Storage containers used in canning, Spoilage of canned foods, Types and causes of spoilage of canned foods

Suggested References

- Srivastava, R.P. and Kumar, S. Fruit and Vegetable Preservation: Principles and Practices, International Book Distributing Co., 2010.
- Desrosier, N.W. and Desrosier, J.N. The Technology of Food Preservation, AVI Publishing Company, 2008.
- Fellows, P.J. Food Processing Technology: Principles and Practice, Woodhead Publishing, 2017.
- Sivasankar, B. Food Processing and Preservation, Prentice Hall of India, 2013.
- Salunkhe, D.K., Kadam, S.S. and Reddy, N.R. Handbook of Fruit Science and Technology: Production, Composition, Storage and Processing, CRC Press, 1998.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Major– VI B. Voc. Paper -VI

Fruits and Vegetables Processing -II

Theory: 30 Hours

(Credits: 02)

Unit–1: - Unfermented and Fermented Fruit Products

(7 Hrs)

Unfermented fruit beverages, Fermented fruit beverages, Nectar and cordials, Role and importance of pectin in fruit products

Unit–2: - Preserved Fruit and Vegetable Products

(7 Hrs)

Jam, jelly and marmalade, Preserved Fruit and Vegetable, Candied and crystallized fruits and vegetables, Pickles, Chutneys and sauces or ketchups

Unit–3: - Quality Control in Fruit and Vegetable Processing

(8 Hrs)

Quality characteristics of fruits and vegetables for processing, Quality standards for processed products, Quality control in food processing industry, Basic quality testing methods, Importance of hygiene and sanitation

Unit–4: - Waste Utilization and Industrial Utilities

(8 Hrs)

Types of fruit and vegetable processing waste, Utilization of fruit and vegetable waste, By-products from fruit and vegetable processing, Water requirements for fruit and vegetable processing industries, Waste management practices in processing industries

Suggested References

- Srivastava, R.P. and Kumar, S. – Fruit and Vegetable Preservation: Principles and Practices, International Book Distributing Co., 2003.
- Desrosier, N.W. and Desrosier, J.N. – The Technology of Food Preservation, CBS Publishers and Distributors, 2008.
- Ranganna, S. – Handbook of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill, 2009.
- Barrett, D.M., Somogyi, L. and Ramaswamy, H. – Processing Fruits: Science and Technology, CRC Press, 2010.
- Fellows, P.J. – Food Processing Technology: Principles and Practice, Woodhead Publishing, 2017.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Major – P- III

(Credits: 02)

Fruits and Vegetables Processing – I

Group –I

1. Estimation of vitamin C content in selected fruits and vegetables.
2. Determination of total soluble solids (TSS) in fruit juice using a refractometer.
3. Preparation of fruit and vegetable samples for canning: washing, grading, and peeling.
4. Blanching of vegetables and evaluation of colour, texture, and enzyme inactivation.
5. Canning of selected fruits using standard filling, exhausting, and sealing techniques.
6. Bottling of fruit juices and preparation of syrup for storage.
7. Study of spoilage in canned fruits and vegetables and identification of causes.
8. Industrial Visit to Fruits & Vegetable Industry.

Fruits and Vegetables Processing – II

Group - II

1. Preparation of unfermented fruit beverages (e.g., squash).
2. Preparation of fermented fruit beverages (e.g., fruit wine).
3. Preparation of nectar from seasonal fruits.
4. Estimation of pectin content in fruits.
5. Preparation of jam from selected fruits.
6. Preparation of tomato ketchup.
7. Determination of quality characteristics of fruits and vegetables (e.g., acidity, TSS).
8. Utilization of fruit and vegetable waste to prepare by-products (e.g., fruit peel powder, compost).

Suggested References

- Ranganna, S. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Tata McGraw-Hill Publishing Company, 2005.
- Desrosier, N. W. and Desrosier, J. N. The Technology of Food Preservation. CBS Publishers & Distributors, 2008.
- Fellows, P. J. Food Processing Technology: Principles and Practice. Woodhead Publishing Limited, 2009.
- Srivastava, R. P. and Kumar, S. Fruit and Vegetable Preservation: Principles and Practices. International Book Distributing Co., 2012.
- Salunkhe, D. K., Bolin, H. R., and Reddy, N. R. Storage, Processing, and Nutritional Quality of Fruits and Vegetables. CRC Press, 1991.
- Potter, N. N. and Hotchkiss, J. H. Food Science. Springer (CBS Publishers), 2014.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Minor– V B. Voc. Paper-V

Food Quality and Sensory Evaluation

Theory: 30 Hours

(Credits: 02)

Unit–1: - Food Quality & Quality Attributes

(8 Hrs)

Food quality – definition & importance, Role of food quality in food industry-consumer acceptance, market value, food safety. Need of quality control-safety, uniformity, shelf life, Factors affecting food quality-raw material, processing, storage, packaging, Quality Attributes-Dominant attributes and Hidden attributes (with examples), Objectives of quality control, Benefits of quality control

Unit–2: - Colour, Viscosity & Consistency

(7 Hrs)

Colour -Importance of colour in food quality, Role of colour in consumer acceptance, Colour measuring instruments -Colorimeter, Tintometer, Hunter Lab. Viscosity-Definition, Types of fluids, Viscometers, Ostwald, Brookfield, Falling ball. Consistency-Definition, Methods: Bostwick consistometer, Line spread test.

Unit–3: - Texture of Foods

(7 Hrs)

Texture – definition, Classification of texture: Mechanical, Geometrical, Surface.

Texture characteristics: Firmness, Juiciness, Chewiness, Stickiness, Grittiness, Mealiness, Measurement of texture: Compression test, Puncture test, Mechanical thumb

Unit–4: - Flavour, Taste & Odour

(8 Hrs)

Flavour-Definition, Role of flavour in food quality, Taste-Definition, Basic tastes: Sweet, Sour, Salty, Bitter Umami. Factors affecting taste: temperature, disease, taste medium. Interaction of tastes.

Odour- Definition, Classification: Pleasant, Unpleasant. Olfactory abnormalities: Anosmia, Hyposmia.

Odour testing methods: Threshold test, Sensory panel.

Suggested References

- Potter, N. N. and Hotchkiss, J. H., Food Science, 5th Edition, CBS Publishers and Distributors, New Delhi, 1996.
- Lawless, H. T. and Heymann, H., Sensory Evaluation of Food: Principles and Practices, 2nd Edition, Springer, New York, 2010.
- Ranganna, S., Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd Edition, Tata McGraw-Hill, New Delhi, 2007.
- Bourne, M. C., Food Texture and Viscosity: Concept and Measurement, 2nd Edition, Academic Press, New York, 2002.
- Fellows, P. J., Food Processing Technology: Principles and Practice, 3rd Edition, Woodhead Publishing, Cambridge, 2009.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Minor– VI B. Voc. Paper-VI

Food Biochemistry

Theory: 30 Hours

(Credits: 02)

Unit–1: - Introduction to Carbohydrates

(7 Hrs)

Definition Carbohydrate, Classification, structure and function of carbohydrates. Functional characteristics of different carbohydrates, browning Reactions, modification of carbohydrates, Dietary fibers.

Unit–2: - Protein in Food

(8 Hrs)

Definition Protein, Classification and structural organization of proteins. Physicochemical properties, protein content and composition in various foods, functional properties of proteins in foods. Effects of processing on functional properties of proteins.

Unit–3: - Lipids in food

(8 Hrs)

Definition of Lipids Role and use of lipids /fat, occurrence, fat group classification. Physicochemical properties. Chemical aspects of lipolysis, auto oxidation, antioxidants. Technology of fat and oil processing - Refining, Hydrogenations, Inter esterification

Unit–4: - Vitamin in Food

(7 Hrs)

Definition of Vitamin, Definition of vitamin, type of vitamin, Water soluble (Vit B-1, B-2, B-3, C) and Fat soluble (Vit A, D, E, K)- their structure and functions

Suggested References

- Fennema, O.R. Food Chemistry, 4th Edition, CRC Press, 2008.
- Belitz, H.D., Grosch, W., and Schieberle, P. Food Chemistry, 4th Revised Edition, Springer, 2009.
- Damodaran, S., Parkin, K.L., and Fennema, O.R. Fennema's Food Chemistry, 5th Edition, CRC Press, 2017.
- deMan, J.M. Principles of Food Chemistry, 3rd Edition, Springer, 1999.
- Coulter, T.P. Food: The Chemistry of Its Components, 6th Edition, Royal Society of Chemistry, 2016.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Minor– P- III

(Credits: 02)

Food Quality and Sensory Evaluation

Group –I

1. Sensory Evaluation of Food Quality.
2. Flow Behaviour Test of Liquid Foods.
3. Determination of Colour of Food Using Colorimeter
4. Measurement of Consistency Using Bostwick Consistometer
5. Texture Evaluation by Finger Compression Method
6. Determination of Quality evaluation of product for size, shape
7. Descriptive testing for sensory evaluation of food
8. Sensory Evaluation of Food Product by 9-Point Hedonic Scale Method

Food Biochemistry

Group - II

1. Estimation of Starch
2. Estimation of Casien
3. Determination of free fatty acid from given food sample
4. Estimation of Vitamin C
5. Determination of Saponification value of an oil
6. Demonstration on Browning reaction on Fruits and vegetables
7. Estimation of iodine value of oil
8. Visit to food industry

Suggested References

- Lawless, H. T., & Heymann, H. – Sensory Evaluation of Food: Principles and Practices, 2nd Edition, Springer, 2010.
- Rao, M. A., Rizvi, S. S. H., & Datta, A. K. – Engineering Properties of Foods, 4th Edition, CRC Press, 2014.
- Meilgaard, M., Civille, G. V., & Carr, B. T. – Sensory Evaluation Techniques, 5th Edition, CRC Press, 2016.
- Ranganna, S. (2014). Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Tata McGraw-Hill Education, New Delhi.
- AOAC (2019). Official Methods of Analysis of AOAC International (21st ed.). AOAC International, Gaithersburg, USA.
- Nielsen, S. S. (2017). Food Analysis (5th ed.). Springer International Publishing, New York.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

OPEN ELECTIVE (OE)- III

Good Manufacturing Practices (Practical)

(Credits: 02)

1. Study of personal hygiene of food handlers
2. Study of hand washing techniques before processing
3. Inspection of work clothing and protective gear
4. Cleaning and sanitization of food contact surfaces
5. Cleaning and maintenance of processing equipment
6. Study of safe storage practices for raw materials
7. Temperature monitoring in storage and processing areas
8. Study of pest control measures in food premises
9. Monitoring water quality used in food processing
10. Study of cleaning schedules and records maintenance
11. Observation of cross-contamination prevention methods
12. Study of GMP compliance in raw material handling
13. Study of equipment calibration and maintenance records
14. Study of hygiene in packaging and labelling areas
15. Study of waste disposal and sanitation practices
16. Observation of GMP in processing of fruit and vegetable products

Suggested References

- Fellows, P. J. – Food Processing Technology: Principles and Practice, 3rd Edition, Woodhead Publishing, 2009.
- Jongen, W. M. F. – Improving the Safety of Fresh Fruit and Vegetables, CRC Press, 2002.
- Srinivasan, V. – Good Manufacturing Practices in Food Industry, New Age International Publishers, 2013.
- Mahindru, S. N. – Food Safety and Quality Management, Kalyani Publishers, 2015.
- Frazier, W. C. & Westhoff, D. C. – Food Microbiology, 5th Edition, Tata McGraw-Hill, 2008.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

OPEN ELECTIVE (OE)- III

चांगल्या उत्पादन पद्धती (प्रात्यक्षिक)

(Credits: 02)

1. अन्न हाताळणाऱ्यांच्या वैयक्तिक स्वच्छतेचा अभ्यास
2. प्रक्रिया करण्यापूर्वी हात धुण्याच्या पद्धतींचा अभ्यास
3. कामाच्या कपड्यांचे आणि संरक्षक उपकरणांचे निरीक्षण
4. अन्नाच्या संपर्कातील पृष्ठभागाची स्वच्छता आणि निर्जंतुकीकरण
5. प्रक्रिया उपकरणांची स्वच्छता आणि देखभाल
6. कच्च्या मालासाठी सुरक्षित संचयन पद्धतींचा अभ्यास
7. संचयन व प्रक्रिया क्षेत्रातील तापमान निरीक्षण
8. अन्नालयांमध्ये किडी नियंत्रण उपायांचा अभ्यास
9. अन्न प्रक्रिया साठी वापरल्या जाणाऱ्या पाण्याच्या गुणवत्तेचे निरीक्षण
10. स्वच्छता वेळापत्रक आणि नोंदी व्यवस्थापनाचा अभ्यास
11. क्रॉस-कंटॅमिनेशन टाळण्याच्या पद्धतींचे निरीक्षण
12. कच्च्या माल हाताळणीतील जीएमपी अनुपालनाचा अभ्यास
13. उपकरणांच्या कॅलिब्रेशन आणि देखभाल नोंदींचा अभ्यास
14. पॅकेजिंग आणि लेबलिंग क्षेत्रातील स्वच्छतेचा अभ्यास
15. कचरा निवारण व निर्जंतुकीकरण पद्धतींचा अभ्यास
16. फळे आणि भाज्यांच्या उत्पादन प्रक्रियेत जीएमपीचे निरीक्षण

Suggested References

- फेलोज, पी. जे. - अन्न प्रक्रिया तंत्रज्ञान: तत्त्वे आणि व्यवहार, तिसरी आवृत्ती, वुडहेड पब्लिशिंग, 2009.
- जॉगन, डब्ल्यू. एम. एफ. - ताज्या फळे आणि भाज्यांची सुरक्षितता सुधारणा, सीआरसी प्रेस, 2002.
- श्रीनिवासन, व्ही. - अन्न उद्योगातील चांगल्या उत्पादन पद्धती, न्यू एज इंटरनॅशनल पब्लिशर्स, 2013.
- महिंद्र, एस. एन. - अन्न सुरक्षा आणि गुणवत्ता व्यवस्थापन, कल्याणी पब्लिशर्स, 2015.
- फ्रेझियर, डब्ल्यू. सी. आणि वेस्टहॉफ, डी. सी. - अन्न सूक्ष्मजीवशास्त्र, पाचवी आवृत्ती, टाटा मॅकग्रा-हिल, 2008.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Vocational Skill Courses (VSC)- I

Major Specific (Practical)

(Credits: 02)

1. Study of maturity indices and grading standards of fresh fruits and vegetables.
2. Determination of physical characteristics of selected fruits and vegetables.
3. Preparation and evaluation of fresh fruit juice using hygienic processing methods.
4. Preparation of fruit syrup and calculation of total soluble solids.
5. Processing of fruit pulp and study of preservation techniques.
6. Preparation of jelly and evaluation of gel strength.
7. Preparation of fruit marmalade and study of peel utilization.
8. Preparation of fruit candy using osmotic dehydration method.
9. Preparation of dried fruit slices using cabinet dryer.
10. Preparation of tomato puree and study of concentration process.
11. Freezing of vegetables and assessment of texture retention.
12. Determination of titratable acidity in fruit and vegetable products.
13. Determination of pH of fruit and vegetable products
14. Sensory evaluation of processed fruit and vegetable products.
15. Study of packaging materials used for fruit and vegetable products.
16. Study of by-products and waste utilization in fruit and vegetable processing.

Suggested References

- Ranganna, S. – Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd Edition, Tata McGraw-Hill, 2007.
- Desrosier, N. W. & Desrosier, J. N. – The Technology of Food Preservation, AVI Publishing, 2010.
- Fellows, P. J. – Food Processing Technology: Principles and Practice, 3rd Edition, Woodhead Publishing, 2009.
- Srivastava, R. P. & Kumar, S. – Fruit and Vegetable Preservation: Principles and Practices, International Book Distributing Co., 2014.
- Cruess, W. V. – Commercial Fruit and Vegetable Products, McGraw-Hill, 2008.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Skill Enhancement Courses (SEC)- I

Sensory Evaluation Test (Practical)

(Credits: 02)

1. To conduct a threshold test for basic tastes using aqueous solutions.
2. To perform a difference test using paired comparison method.
3. To evaluate samples using triangle test for product difference detection.
4. To conduct duo–trio test for identifying sensory differences between samples.
5. To perform ranking test for ordering samples based on intensity.
6. To conduct rating test using numerical scales for product quality.
7. To carry out hedonic scale test for consumer acceptability of food products.
8. To evaluate food products using 9-point hedonic scale method.
9. To perform flavour profile analysis of selected food products.
10. To conduct texture profile evaluation by sensory methods.
11. To perform descriptive sensory analysis of processed food products.
12. To study colour evaluation of food samples under controlled lighting.
13. To evaluate odor and aroma characteristics of food products.
14. To conduct time–intensity sensory test for flavour perception.
15. To evaluate overall acceptability of food products using trained panel.
16. To study panelist selection and training for sensory evaluation tests.

Suggested References

- Lawless, H. T. & Heymann, H. – Sensory Evaluation of Food: Principles and Practices, 2nd Edition, Springer, 2010.
- Stone, H., Bleibaum, R. N. & Thomas, H. A. – Sensory Evaluation Practices, 4th Edition, Academic Press, 2012.
- Meilgaard, M., Civille, G. V. & Carr, B. T. – Sensory Evaluation Techniques, 5th Edition, CRC Press, 2016.
- Amerine, M. A., Pangborn, R. M. & Roessler, E. B. – Principles of Sensory Evaluation of Food, Academic Press, 2009.
- IFT (Institute of Food Technologists) – Sensory Evaluation Guide for Testing Food and Beverage Products, IFT Press, 2015.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. III

Co-Curricular Courses (CC-I)

Yoga Education

(Credits: 02)

Note: For this course, follow the common syllabus and evaluation guidelines issued by the university separately.

Examination Pattern: -

- | | |
|---|----------|
| 1. Participation in activities | 30 marks |
| 2. Seminar, Report, Group Discussion, Viva Voce, etc. | 20 marks |
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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Major– VII B. Voc. Paper-VII

Food Analytical Techniques

Theory: 30 Hours

(Credits: 02)

Unit I: Proximate Analysis of Food

(8 Hrs)

Preparation of food samples for analysis, Proximate analysis of foods: Estimation of moisture, Estimation of protein, Estimation of fat, Estimation of crude fiber, Estimation of ash, Calculation of carbohydrate by difference

Unit II: Colorimetry and Spectrophotometry

(7 Hrs)

Introduction to colorimetry and spectrophotometry, Principle of colorimetry, Principle of spectrophotometry, Beer–Lambert’s law, Construction and working of colorimeter, Standard solutions and blank solutions, Applications in food analysis.

Unit III: Electrophoresis

(7 Hrs)

Electrophoresis: Definition, Principle of electrophoresis, Types of electrophoresis- Moving boundary electrophoresis and Zone electrophoresis, Applications of electrophoresis

Unit IV: Chromatographic Techniques

(8 Hrs)

Introduction and principle of chromatography, Classification of chromatographic techniques, Gel chromatography, Ion exchange chromatography, Paper chromatography, Column chromatography, High Performance Liquid Chromatography (HPLC)

Suggested References

- Ranganna, S. – Handbook of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill, 2014.
- AOAC – Official Methods of Analysis of AOAC International, 20th Edition, AOAC International, 2016.
- Nielsen, S. S. – Food Analysis, 5th Edition, Springer, 2017.
- Skoog, D. A., Holler, F. J., and Crouch, S. R. – Principles of Instrumental Analysis, 6th Edition, Cengage Learning, 2007.
- Wilson, K. and Walker, J. – Principles and Techniques of Biochemistry and Molecular Biology, 7th Edition, Cambridge University Press, 2010.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Major– VIII B. Voc. Paper -VIII

Dairy Technology

Theory: 30 Hours

(Credits: 02)

Unit I: Introduction to Dairy Technology

(8 Hrs)

Definition of Milk, Composition of milk, Nutritive value of milk, Factor affecting composition of milk, Physico- chemical properties of milk, processing of milk Dairy plant sanitization Cleaning in place and Detergents and sanitizers used

Unit II: Processing of milk

(7 Hrs)

Milk Processing flow sheet Filtration / clarification, standardization, Homogenization, Pasteurization. Storage of Milk, Adulterants in milk

Unit III: Milk Processing and Types of Milk and Milk Products

(7 Hrs)

Flavoured milk, Recombinant milk, Toned milk, Double toned milk, Sweetened milk, Sterile milk, Condensed milk, Skimmed milk, acidophilus milk, butter milk

Unit IV: Milk and Milk Products Processing and Utilization

(8 Hrs)

Manufacture of Ice Cream, Cream, Paneer, Butter, Ghee, Milk powder, Khoa, Cheese and milk-based, composition and industrial uses. Production of lactose and whey Fermented products Yoghurt, Curd

Suggested References

- Walstra, P., Wouters, J. T. M., and Geurts, T. J., Dairy Science and Technology, 2nd Edition, CRC Press, 2006.
- De, S., Outlines of Dairy Technology: Processing of Milk and Milk Products, Oxford University Press, 2010.
- Fox, P. F., and McSweeney, P. L. H., Dairy Chemistry and Biochemistry, Springer, 1998.
- Spreer, E., Milk and Dairy Product Technology, Marcel Dekker Inc., 1998.
- Robinson, R. K. (Ed.), Dairy Microbiology Handbook: The Microbiology of Milk and Milk Products, 3rd Edition, Wiley, 2002.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Major – P- IV

(Credits: 02)

Food Analytical Techniques

Group –I

1. Principle and working of analytical instrument such as colorimeter, balances, oven, muffle furnace, incubator, centrifuge.
2. Estimation of Moisture from food sample.
3. Estimation of Protein from food sample.
4. Estimation of Fat from food sample.
5. Qualitative test for carbohydrates.
6. Estimation of starch by Anthrone reagent.
7. Estimation of crude Fiber from food sample
8. Visit to Food Analytical Laboratory.

Dairy Technology

Group - II

1. Determination of Acidity of milk.
2. Platform test of milk.
3. Preparation of Flavoured milk.
4. Preparation of Channa and Rasgulla.
5. Preparation of Panner.
6. Preparation of Shrikhand.
7. Preparation of lassi.
8. Visit to Dairy industry.

Suggested References

- Ranganna, S. (2014). Handbook of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill Education, New Delhi.
- AOAC (2019). Official Methods of Analysis of AOAC International (21st Edition), AOAC International, Gaithersburg, USA.
- Nielsen, S. S. (2017). Food Analysis (5th Edition), Springer International Publishing, New York.
- De, S. (2013) – Outlines of Dairy Technology: Manufacture of Milk Products, Oxford University Press, New Delhi.
- Walstra, P., Wouters, J. T. M., & Geurts, T. J. (2006) – Dairy Science and Technology, CRC Press, Boca Raton.
- Ranganna, S. (2014) – Handbook of Analysis and Quality Control for Fruit and Vegetable Products (applicable sections for milk and dairy analysis), Tata McGraw-Hill, New Delhi.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Minor– VII B. Voc. Paper-VII

Post Harvest Technology

Theory: 30 Hours

(Credits: 02)

Unit I: Introduction to Post-Harvest Technology

(8 Hrs)

Definition and scope of post-harvest technology, History and development of post-harvest technology, Role and importance of post-harvest technology in food security, Objectives of post-harvest management, Losses in post-harvest systems

Unit II: Harvesting Factors and Post-Harvest Physiology

(7 Hrs)

Factors affecting quality of harvested produce, Pre-harvesting factors influencing quality, Maturity indices and stages of harvest, Methods of harvesting, post-harvest physiology of foods, Physiological changes after harvest

Unit III: Post-Harvest Handling of Foods of Animal Origin

(7 Hrs)

Post-harvest handling of foods of animal origin, post-slaughter handling of meat, Handling, preservation, and storage of meat, post-harvest handling of fish and seafood, Handling and storage of milk and milk products

Unit IV: Food Storage Systems

(8 Hrs)

Concept and importance of food storage, Direct and indirect damage during storage, Sources of infestation, Traditional storage structures, Improved and modern storage structures, Storage of agricultural perishables, Controlled atmosphere and modified atmosphere storage.

Suggested References

- Kader, A.A. (Ed.) – Postharvest Technology of Horticultural Crops, University of California Agriculture and Natural Resources, 2002.
- Wills, R., McGlasson, B., Graham, D., & Joyce, D. – Postharvest: An Introduction to the Physiology and Handling of Fruit, Vegetables and Ornamentals, CABI Publishing, 2007.
- Sahay, K.M. & Singh, K.K. – Unit Operations of Agricultural Processing, Vikas Publishing House, 2016.
- James, S.J. & James, C. – Meat Refrigeration, Woodhead Publishing, 2012.
- Bala, B.K. – Postharvest Technology of Cereals, Pulses and Oilseeds, Oxford & IBH Publishing, 2013.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Minor– VIII B. Voc. Paper -VIII

Food Safety, Hygiene and Sanitation

Theory: 30 Hours

(Credits: 02)

Unit I: Introduction to Food Safety

(7 Hrs)

Definition and concept of food safety, Importance of safe foods for consumers and public health, Types of food safety hazards: Biological hazards, Chemical hazards, Physical hazards. Factors affecting food safety, Role of food safety in food industries

Unit II: Food Safety Management Tools

(8 Hrs)

Basic concept of food safety management systems, Prerequisite programs: Good Hygiene Practices (GHPs), Good Manufacturing Practices (GMPs), Standard Operating Procedures (SOPs), Hazard Analysis and Critical Control Point (HACCP) system, ISO series related to food safety, Total Quality Management (TQM), Risk analysis in food safety, Accreditation and auditing

Unit III: Industrial By-Products and Waste Utilization

(8 Hrs)

Introduction to by-products and waste utilization in food industries, Scope and importance of waste utilization in India, By-products and waste from agricultural and agro-based industries, Waste utilization from industries: Cereal and cereal product industries, Fruit and vegetable processing industries, Meat processing industries, Poultry and fish processing industries, Milk and milk product industries

Unit IV: Hygiene and Sanitation in Food Industry

(7 Hrs)

Introduction to hygiene and sanitation, Sources of contamination in food industries, Methods of contamination control: Physical methods, Chemical methods, Waste disposal methods, Pest and rodent control, Personnel hygiene, Food safety measures in food handling and processing

Suggested References

- Mortimore, S. and Wallace, C. – HACCP: A Practical Approach, Springer, 2013.
- Fellows, P. J. – Food Processing Technology: Principles and Practice, Woodhead Publishing, 2009.
- Adams, M. R. and Moss, M. O. – Food Microbiology, Royal Society of Chemistry, 2008.
- Hui, Y. H. – Handbook of Food Science, Technology and Engineering, CRC Press, 2006.
- Vasudeva, R. P. and Sharma, V. K. – Food Safety and Quality Management, Daya Publishing House, 2010.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Minor– P- IV

(Credits: 02)

Post Harvest Technology

Group –I

1. Determination of physiological loss in weight in fruits and vegetables under cold conditions.
2. Determination of Acidity in lemon juice, grapes in different stages.
3. Estimations of sugars.
4. Determination of Vitamin C.
5. Determination of juice content of fruits
6. Wax coating of fruits
7. Preparation of fruit squash
8. Preparation of fruit syrup.

Food Safety, Hygiene and Sanitation

Group - II

1. Preparation of inspection schedule and inspection chart.
2. Study of CIP system.
3. Preparation of detergent and sanitizer solution of desire strength.
4. Test for sanitization of dairy equipment (swab method).
5. Contamination control method using physical and chemical method.
6. To study personal hygiene habit.
7. Determination of turbidity of the given sample of water.
8. Preparation of HACCP Plan.

Suggested References

- Ranganna, S. (2014) – Handbook of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill, New Delhi.
- Desrosier, N. W. and Desrosier, J. N. (2009) – The Technology of Food Preservation, CBS Publishers & Distributors, New Delhi.
- Srivastava, R. P. and Kumar, S. (2010) – Fruit and Vegetable Preservation: Principles and Practices, International Book Distributing Co., Lucknow.
- Varnam, A.H. and Sutherland, J.P. Milk and Milk Products: Technology, Chemistry and Microbiology, Springer, 1994.
- Early, R. Technology of Dairy Products, Springer Science and Business Media, 2000.
- Mortimore, S. and Wallace, C. HACCP: A Practical Approach, Springer, 2013.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

OPEN ELECTIVE (OE)- IV

Food Machinery and Equipments (Practical)

(Credits: 02)

1. Identification and study of common food processing equipment
2. Study and operation of a hammer mill
3. Study and operation of a pulverizer
4. Study of a mini grain mill
5. Study and operation of a sieve shaker
6. Study of various types of weighing balances
7. Study of packaging machines (manual/semi-automatic)
8. Study and operation of sealing machines
9. Study of juice extraction machines
10. Study of milk processing equipment
11. Study of butter churner and operation
12. Study of cream separator
13. Study and operation of food blender and mixer
14. Study of food dehydrator
15. Study of conveyor system in food processing
16. Maintenance and safety practices of food machinery

Suggested References

- Fellows, P. (2017). Food Processing Technology: Principles and Practice. Woodhead Publishing.
- Roday, S. (2016). Fundamentals of Food Process Engineering. PHI Learning Pvt. Ltd.
- Heldman, D. R., & Lund, D. B. (2018). Handbook of Food Engineering. CRC Press.
- Srilakshmi, B. (2017). Food Science. New Age International Publishers.
- Toledo, R. T. (2016). Fundamentals of Food Process Engineering. Springer.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

OPEN ELECTIVE (OE)- IV

अन्न यंत्रे आणि उपकरणे (प्रात्यक्षिक)

(Credits: 02)

1. अन्न प्रक्रिया उपकरणांची ओळख आणि अभ्यास
2. हॅमर मिलचे अध्ययन व ऑपरेशन
3. पल्परायझरचे अध्ययन व ऑपरेशन
4. मिनी धान्य मिलचे अध्ययन
5. सिव्हा शेकर्सचे अध्ययन व ऑपरेशन
6. विविध प्रकारच्या मोजमाप यंत्रांचा अभ्यास
7. पॅकिंग मशीन (मॅन्युअल/सेमी-ऑटोमॅटिक) चे अध्ययन
8. सीलिंग मशीनचे अध्ययन व ऑपरेशन
9. रस काढण्याच्या यंत्रांचे अध्ययन
10. दूध प्रक्रिया उपकरणांचे अध्ययन
11. बटर चर्नरचे अध्ययन व ऑपरेशन
12. क्रीम सेपरेटरचे अध्ययन
13. फूड ब्लेंडर व मिक्सरचे अध्ययन व ऑपरेशन
14. फूड डीहायड्रेटरचे अध्ययन
15. अन्न प्रक्रिया मध्ये कन्हेयर सिस्टीमचे अध्ययन
16. अन्न प्रक्रिया उपकरणांचे देखभाल व सुरक्षा पद्धती

Suggested References

- फेलोज, पी. (2017). अन्न प्रक्रिया तंत्रज्ञान: तत्त्वे आणि व्यवहार. वूडहेड पब्लिशिंग.
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- हेल्डमन, डी. आर., आणि लंड, डी. बी. (2018). अन्न अभियांत्रिकी हस्तपुस्तिका. सीआरसी प्रेस.
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- टोलेडो, आर. टी. (2016). अन्न प्रक्रिया अभियांत्रिकीची मूलतत्वे. स्प्रिंगर.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Skill Enhancement Courses (SEC)- II

Food Acidity and pH Analysis (Practical)

(Credits: 02)

1. To conduct a threshold test for basic tastes using aqueous solutions.
2. To perform a difference test using paired comparison method.
3. To evaluate samples using triangle test for product difference detection.
4. To conduct duo–trio test for identifying sensory differences between samples.
5. To perform ranking test for ordering samples based on intensity.
6. To conduct rating test using numerical scales for product quality.
7. To carry out hedonic scale test for consumer acceptability of food products.
8. To evaluate food products using 9-point hedonic scale method.
9. To perform flavour profile analysis of selected food products.
10. To conduct texture profile evaluation by sensory methods.
11. To perform descriptive sensory analysis of processed food products.
12. To study colour evaluation of food samples under controlled lighting.
13. To evaluate odor and aroma characteristics of food products.
14. To conduct time–intensity sensory test for flavour perception.
15. To evaluate overall acceptability of food products using trained panel.
16. To study panelist selection and training for sensory evaluation tests.

Suggested References

- Food Analysis – S. Suzanne Nielsen, 5th Edition, Springer, 2017
- Introduction to Food Chemistry – Richard Owusu-Apenten, 2nd Edition, CRC Press, 2005
- Food Science – Norman N. Potter, Joseph H. Hotchkiss, 5th Edition, Springer, 1998
- Food Processing and Preservation – P. Fellows, 5th Edition, Woodhead Publishing, 2017
- Principles of Food Science – Janet D. Ward & Larry T. Ward, 3rd Edition, Springer, 2004

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part II (Food Processing Technology) NEP 2.0 Syllabus with effect from June 2026

B. Voc. II (Food Processing Technology) Sem. IV

Community Engagement Programme (CEP)- I

(Credits: 02)

1. INTRODUCTION:

New generation of students are increasingly unaware of local rural and peri-urban realities surrounding their HEIs, as rapid urbanization has been occurring in India. A large percentage of Indian population continues to live and work in rural and peri-urban areas of the country. While various schemes and programs of community service have been undertaken by HEIs, there is no singular provision of a well-designed community engagement course that provides opportunities for immersion in rural realities. Such a course will enable students to learn about challenges faced by vulnerable households and develop an understanding of local wisdom and life style in a full manner.

2. OBJECTIVES:

- To promote a respect for rural culture, life style, and wisdom among students.
- To learn about the present status of agricultural and development initiatives.
- Identify and address the root causes of distress and poverty among vulnerable households.
- Improve learning outcomes by applying class room knowledge to real-world situations.

To achieve the objectives of the socio-economic development of New India, HEIs can play an important role through active community engagement. This approach will also contribute to improve the quality of both teaching and research in HEIs in India. India is a signatory to the global commitment for achieving Sustainable Development Goals (SDGs) by 2030. Achieving these 17 SDG goals requires generating locally appropriate solutions. Community engagement should not be limited to a few social science disciplines only. It should be practiced across all disciplines and faculties of HEIs. These can take the forms of enumerations, surveys, awareness camps and campaigns, training, learning manuals/films, maps, study reports, public hearings, policy briefs, cleanliness and hygiene teachings, legal aid clinics, etc. For example, students of chemistry can conduct water and soil testing in local areas and share the results with the local community. Students of science and engineering can undertake research in partnership with the community on solid and liquid waste disposal. Therefore, students are being encouraged to foster social responsibility and community engagement in their teaching and research.

3. LEARNING OUTCOMES:

After completing this course, students will be able to

- Gain an understanding of rural life, Indian culture, and social realities.
- Develop empathy and bond so mutuality with the local community.
- Appreciate the significant contributions of local communities to Indian society and economy.
- Learn to Value local knowledge and wisdom.
- Identify opportunities to contribute to the community's economic improvement.

4. Credits: Two credit Course; Students are expected to complete 60 hours of participation

5. COURSE STRUCTURE:

Sr.	Module Title	Module Content	Teaching/Learning/Methodology
1	Understanding CEP	Introduction, Guidelines, Necessities	Classroom discussions, Field visit. Survey, Individual / Group conference, Report submission & VIVA
2	Identification of the topic and area	Use of survey, Field visits, communication with society	
3	Organization of Activities	Organization of Hands-on Training, Exhibitions, lectures, community conferences	
4	Project	Detailed report of the outcome of the works	

Note: Faculty can make addition in the list of activities as per domain content:

Recommended field-based activities (Tentative):

- Participate in Gram Sabha meetings, and study community participation;
- Visit to Swatch Bharat Mission project sites, conduct analysis and initiate problem solving measures;
- Interaction with Self Help Groups (SHGs) women members, and study their functions and challenges; planning for their skill-building and livelihood activities;
- Visit Mahatma Gandhi National. Rural Employment Guarantee Act 2005 (MGNREGS) project sites, interact with beneficiaries and interview function ariest the worksite;
- Surveys on Mission A today at a support under Gram Panchayat Development Plan
- Visit Rural Schools /mid-day meal centres, study academic can infrastructural resources, digital dividend gaps;
- Associate with Social audit exercise sat the Gram Panchayat level, and interact with programme beneficiaries;
- Visit to local Nagar palika office and review schemes forebrain formal workers and migrants;
- Attend Parent Teacher Association meetings, and interview school dropouts;
- Visit local Anganwadi and observe these rives being provided;
- Visit local NGOs, civil society organizations and interact with their staff and beneficiaries;
- Organize awareness programmers, health camps, Disability camps and cleanliness camps;
- Conduct soil health test, drinking water analysis, energy use and fuel efficiency surveys and building solar powered village;
- Understanding of people's impacts of climate change, building up community's disaster preparedness;
 - Organize orientation programmers for farmers regarding organic cultivation, rational use of irrigation and fertilizers, promotion of traditional species of crops and plants and awareness against tubule burning;
 - Formation of committees for common property resource management, village pond maintenance and fishing;
 - Identifying the small business ideas (hand loom, handy craft, khadi, food products, etc.) For rural areas to make the people self-reliant.
 - Inter active with local leaders, panchayat function Aries, grass-root officials and local institutions

regarding village development plan preparation and resource mobilization;

- Financial Literacy Awareness Programme
- Digital Literacy Awareness Programme
- Education Loan Awareness Programme
- Entrepreneurship Awareness Programme
- Awareness Programmers on Government Schemes
- Products Market Awareness
- Services Market Awareness
- Consumer Awareness Programme
- Accounting Awareness Programme for Farmers
- Accounting Awareness Programmer or Street Vendors etc.

6. IMPORTANT RULES AND REGULATIONS FOR CEP:

Concurrent Fieldwork:

Students must conduct comprehensive studies on various challenges that they face in their chosen field. Every work relevant to the subject matter should be compiled and documented.

Students should keep separate fieldwork diary or maintain journal in order to record their fieldwork experiences i.e. reading, e- contents, tasks, planning and work hours have to be recorded in the diary. Detailed work records report on students' fieldwork experiences and activities to be submitted and should be presented. The fieldwork conference is part of the timetable and is mandatory. Faculty should hold a fieldwork conference FOREIGHTNIGHTLY for all students.

In addition to the principal curriculum, the students engage in a variety of community development- related activities. They are encouraged to plan and carry out programs, processions, and events for social causes. These activities seek to enhance students' personal and professional skills as well as foster self- development. "Rural Camp" should be embedded in the curriculum for first-year students to be held in the backward and neglected areas of District's.

Concurrent Fieldwork is the core curriculum activity in the CEP course. Hence, 100% attendance of the students is mandatory in case of absence on any student, supplementary fieldwork must be arranged and accomplished with the approval of the faculty supervisor.

7. EVALUATION/ASSESSMENT SCHEME:

Students should keep a Field Diary / journal to record, content, readings and field visit planning. The assessment pattern is internal and external i.e. 30+20.

Internal continuous Assessment: Participation in concurrent field visits 40%; individual/group field project conference, report/journal submission 40%.

External Assessment: Presentation of field project findings (VIVA) should be assigned 20%.

Shivaji University, Kolhapur
B. Voc. II Syllabus (NEP-2.0)
To be implemented from June 2026 onwards
Name of College
COMMUNITY ENGAGEMENT PROGRAMME (CEP)
In Food Processing Technology

Diary

Name of Student:	
Roll No.	Exam Seat No:

No.	Date	Activity	Type of Activity	Time Duration	Sign of Student	Signature of Teacher
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Total 30 Hours participation is required.

Teacher in Charge

H.o.D.

Principal

B. Voc. II Syllabus (NEP-2.0)
To be implemented from June 2026 onwards Semester – III & IV
Nature of a Question Paper

Time: 1 hours

Total Marks: 30

Solve questions from the following.

Q. 1 Multiple choice Question

06 Marks

- i.
- ii.
- iii.
- iv.
- v.
- vi.

Q. 2 Long answer Question (Any Two out of three)

12 Marks

- i.
- ii.
- iii.

Q. 3 Short Answer Questions (Any Four out of six)

12 Marks

- i.
- ii.
- iii.
- iv.
- v.
- vi.

Internal Assessment

20 Marks

- Home Assignment
- Class Assignment (Tutorial Type)
- Quiz
- Mid-Term Test

Nature of Practical Question Paper:

Internal practical examination

50 marks

1. Group I 20 Marks
2. Group II 20 Marks
3. Submission of Certified Journal 10 Marks