



UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A ++' GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION (25/August/Adp./ 61)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the revised Syllabi and Courses of Studies of the subject of **Food Science and Quality Control** of Semester I, II and III for **Four Year Under Graduate Programme (FYUGP)** as per **NEP-2020 (as given in the annexure)** for the **Regular Candidates** for the examinations to be held in the years as per the details given below:-

Subject	Semester	Existing Code Course	New Code Course	For the examinations to be held in the year	Change of %
Food Science and Quality Control	Semester-I	UMDFST-103	UMDFST-103	Dec. 2025, 2026 and 2027	20%
		USEFST-104	USEFST-111	Dec. 2025, 2026 and 2027	100%
	Semester-I	UMIFST-202	UMIFST-202	May 2026, 2027 and 2028	20%
		UMDFST-203	UMDFST-205	May 2026, 2027 and 2028	100%
		USEFST-204	USEFST-211	May 2026, 2027 and 2028	100%
	Semester-III	UMDFST-304	UMDFST-306	Dec. 2026, 2027 and 2028	100%
		USEFST-305	USEFST-311	Dec. 2026, 2027 and 2028	100%

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/25/ 8500-32

Dated: 03.09.2025

Copy for information and necessary action to:

1. Dean, Faculty of Science
2. Convener, Board of Studies in **Food Science and Quality Control**
3. All members of the Board of Studies
4. Sr. P.A. to the Controller of Examinations
5. Director, Centre for IT Enabled services and Management, University of Jammu for information and for uploading on University Website.
6. C.A. to the Controller of Examinations
7. Director, Computer Centre, University of Jammu.
8. Joint Registrar/Deputy Registrar/Asst. Registrar (Conf./Exam UG/Exam. Non Prof.)

Abheca
4/9/25
Joint Registrar (Academic)

15/9/25
4/9/25
7/9/25

PERCENTAGE OF CHANGE IN FYUP UNDER NEP

Subject: Food Science and Quality Control (1st to 3rd Semester)

S. NO.	COURSE TYPE	EXISTING		REVISED		Percent age of change
		COURSE NO.	COURSE TITLE	COURSE NO.	COURSE TITLE	
SEMESTER 1						
1	Major	UMJFST-101	Introduction to Food Science	NO CHANGE		
2	Minor	UMIFST-102	Introduction to Food Science	NO CHANGE		
3	Multidisciplinary	UMDFST-103	Food Science -- Basic Concepts	Less than 20% change		
4	Skill Enhancement Course	USEFST-104	Food Product Development and Entrepreneurship	USEFST-111	Food product development and entrepreneurship	100% change
SEMESTER 2						
1	Major	UMJFST-201	Food Quality Assurance and Packaging	NO CHANGE		
2	Minor	UMIFST-202	Quality Control and Packaging Technology	Less than 20% change		
3	Multidisciplinary	UMDFST-203	Technology of Food Processing and Preservation	UMDFST-205	Food Science- Basic concepts	100% Change
4	Skill Enhancement Course	USEHST-204	Food Product Development and Entrepreneurship	USEFST-211	Technology of processing of fruits And vegetables	100% change
SEMESTER 3						
1	Major	UMJFST-301	Food Nutrition and Chemistry	NO CHANGE		
2	Major	UMJFST-302	Food Microbiology	NO CHANGE		
3	Minor	UMIFST-303	Introduction to Food Nutrition and Chemistry	NO CHANGE		
4	Multi-disciplinary	UMDFST-304	Food Quality Assurance and Sensory Evaluation	UMDFST-306	Food Science- Basic concepts	100% change
5	Skill Enhancement Course	USEFST-305	Bakery Technology and Entrepreneurship	USEFST-311	Bakery technology and entrepreneurship	100% change

Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

Food Science and Quality Control

Semester I

(Examination to be held in December 2025, 2026, 2027)

Multidisciplinary Course

Course Code: UMDFST-103

Credits: 3

Maximum Marks: Theory: 75

Course Title: Food Science – Basic Concepts

Total No. of Lectures: Theory: 45hr

Course Outcomes:

- Enable the students to be familiar with various basic concepts of Food Science and Technology
- Create awareness regarding application of Food Science

Unit-I

- Food Science – Basic Concepts
- Scope, importance and constraints of food processing
- Classification of foods on the basis of shelf life, pH and origin.
- Different types of food spoilage viz: Microbial, physical, biochemical.

Unit-II

Food Microbiology:

- Microbial spoilage of different food products
- Useful Microbes in food and human health.
- Food borne diseases (Salmonellosis, Botulism, Diarrhea, and Eschrechia Coli).

Unit III

Principles of Food Preservation:

- Preservation by sugar and salt.
- Preservation by low temperature(Freezing, Refrigeration)
- Preservation by high temperature (Pasteurization, Sterilization and Aseptic).
- Preservation through moisture removal processes
- Preservation by use of irradiation.
- Preservation by use of Chemicals.

Unit IV

Food Nutrition:

- Sources and nutritional importance of: Carbohydrates, Proteins, Fats.
- Sources and functions of: Vitamins and Minerals (Calcium, Iron, Iodine, Zinc and Selenium).

Syllabi of Food Science and Quality Control for FYUP as per NEP-2020**Food Science and Quality Control****Semester I****(Examination to be held in December 2025, 2026, 2027)****Multidisciplinary Course****Course Code: UMDFST-103****Course Title: Food Science – Basic Concepts****Credits: 3****Total No. of Lectures: Theory: 45hr****Maximum Marks: Theory: 75****Text and Reference Books:**

1. *Food Science by B. Srilakshmi*
2. *Food Science – Norman N. Potter, Joseph H. Hotchkiss*
3. *Food Chemistry – H D Blitz, W. Grosch*
4. *Food Chemistry and Nutrition – A.W. Duncan*
5. *Food Microbiology - William Frazier, Dannise Westhoff*

Scheme of Examination:

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies.	1½ Hours	15 Marks
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	03 Hours	60 Marks

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SKILL ENHANCEMENT COURSE
(Effective from July 2025 onwards)

Semester	Course Code	Course Title	Credits	Marks
1 st	USEFST -111	FOOD PRODUCT DEVELOPMENT AND ENTREPRENEURSHIP	3	75
2 nd	USEFST -211	TECHNOLOGY OF PROCESSING OF FRUITS AND VEGETABLES	3	75
3 rd	USEFST -311	BAKERY TECHNOLOGY AND ENTREPRENEURSHIP	3	75

UNIVERSITY OF JAMMU
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SEMESTER I
SKILL ENHANCEMENT COURSE
(Examination to be held in December 2025, 2026, 2027)

Course Code: USEFST-111

Course Title: Food Product Development and Entrepreneurship

Credits: 3 (Theory: 1 Credit + Practical: 2 Credits)

Maximum Marks: Theory = 75 (25 Theory + 50 Practical)

Course Outcomes: By the end of the course, students will be able to:

1. Explain the concepts, types, and driving factors behind new food product development.
2. Apply principles of recipe formulation, food preservation, sensory evaluation, and packaging in product development.
3. Analyze consumer needs and market trends to develop nutritionally sound and feasible food products.
4. Develop a basic business plan and demonstrate entrepreneurial skills for launching a food product.

THEORY (1 credit)

Unit-I

- New Food Products: Definition, Classification
- Reasons for new food product development
- Factors shaping new product development
- Business Idea Generation
- Sources of idea and evaluation

Unit-II

- Brief introduction of phases in food product development
- Recipe development, food safety and food spoilage.
- Basic concept of Shelf Life
- Sensory Evaluation
- Different preservation methods, packaging, labelling

Unit-III

- Entrepreneurship: Preparation of business plan, Plant location, investment

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SEMESTER I
SKILL ENHANCEMENT COURSE
(Examination to be held in December 2025, 2026, 2027)

Course Code: USEFST-111

Course Title: Food Product Development and Entrepreneurship

PRACTICAL (2 Credits)

1. To conduct the market research for various new products available.
2. To develop a new product: The process of development of the product in laboratory would involve:
 - Study of the ingredient characteristics
 - Idea generation
 - Feasibility
 - Technique standardization
 - Variations
 - Product standardization
 - Product development
 - Sensory evaluation
 - Product modification
 - Final product
 - Label design and Packaging

REFERENCES

1. Clarke, D. G., & Wright, W. (1999). *Managing new product and process development: Text and cases*. Woodhead Publishing.
2. Desai, V. (2012). *Fundamentals of entrepreneurship and small business management* (6th ed.). Himalaya Publishing House.
3. Earle, M., & Earle, R. (2001). *Creating new foods: The product developer's guide*. Chadwick House Group.
4. Fuller, G. W. (2004). *New food product development: From concept to marketplace* (2nd ed.). CRC Press.
5. Kumar, S., & Suresh, D. N. (2016). *Entrepreneurship development*. New Age International Publishers.

SCHEME OF EXAMINATION

Description	Marks
Mid Term Examination Part-1 There will be a written examination. There will be 2 sections in the question paper with pattern as follows:	25 marks

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<p>Section A shall comprise of 4 short answer type questions of 2 ½ marks each, covering all three units with at least one question from each unit. The students have to attempt all the 4 questions from Section A:</p> <p>Section B shall comprise of a total of 6 questions with two questions from each unit. Each question shall be of 5 marks. The students have to attempt 3 questions selecting only one question from each unit.</p>	
<p>Evaluation of Skills: Final Examination Part-2 The Evaluation of skills will be internal. The evaluation of Skills will be done internally through the Board of three members (including the trainer of the Course)</p>	50 marks

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Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

**Food Science and Quality Control
Semester II
(Examination to be held in May 2026, 2027, 2028)
Minor Course (Theory)**

Course Code: UMIFST202 Course Title: Quality Control and Packaging Technology
Credits: 03 Total No. of Lectures: 45
Maximum Marks: 100
Theory: 75
Practical/Tutorial: 25

Course learning outcomes:

- Creating an understanding about food quality and its evaluation.
- Acquainting students about packaging requirements of food and properties of different packaging materials used in food packaging

Unit – I

- Food sampling-Definition and types
- Concept of Hazard Analysis Critical Control Point (HACCP), Good Manufacturing Practices (GMP).
- Introduction of National (FSSAI) Food laws.

Unit –II

- Sensory evaluation of foods-Introduction; Sensory perception-Appearance, flavour, texture, Sound and Taste
- Selection of sensory panelists.
- Different sensory tests: Paired Comparison, Triangle test, Ranking test, Scoring test, Hedonic scale

Unit – 3

- Packaging- definition and functions
- Properties of different packaging materials-Glass, Metal and Polymers.
- Packaging requirements of different food products

Unit – 4

- Novel Food Packaging techniques- Active packaging, MA and CA
- Food Packaging Laws and Regulations.
- Testing Procedures for Packaging Materials- thickness, tensile strength, puncture resistance, bursting strength, seal strength, water vapor permeability, Gas permeability, grease resistance

Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

**Food Science and Quality Control
Semester II
(Examination to be held in May 2026, 2027, 2028)
Minor Course (Theory)**

Course Code: UMIFST202 Course Title: Quality Control and Packaging Technology
Credits: 03 Total No. of Lectures: 45
Maximum Marks: 100
Theory: 75
Practical/Tutorial: 25

References:

1. Eram S. Rao., *Food Quality Evaluation, Variety Books Publishers and Distributors (2013)*
2. Pomeranz, Y. *Food Analysis-Theory and Practice, Springer*
3. Nielsen, Suzanne, *Food Analysis, Springer US (2010)*
4. Gordon Robertson, *Food Packaging Principles, 3rd Edition (2013), CRC Press*
5. Paine, Frank A., Paine, Heather Y, *Food Packaging, 2nd Edition, Springer US*
6. Dong Sun Lee, Kit L. Yam, Luciano Piergiovanni, *Food Packaging Science and Technology, CRC Press*

Practicals

Credits: 01
Total No. of Lectures: 30

Maximum Marks: 25

Note : Perform any five of the following experiments as per the availability of equipment/ apparatus.

List of Experiments:

1. To examine the quality of fruits & vegetables.
2. Sensory methods for measuring food attributes- Threshold Test
3. To perform Rating/Ranking tests.
4. Common adulterants in milk/ chili powder/ honey and their detection. (Any one)
5. Identification of different packaging materials.
6. Determination of GSM
7. To find the thickness of packaging material using Screw Gauge.
8. Determination of shelf life of packaged foods
9. Visit to research labs and industries.

Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

Food Science and Quality Control
Semester II
(Examination to be held in May 2026, 2027, 2028)
Minor Course (Theory)

Course Code: UMIFST202 Course Title: Quality Control and Packaging Technology

Credits: 03

Total No. of Lectures: 45

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Scheme of Examination

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
<p>Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies.</p>	1½ Hours	15 Marks
<p>End Semester University Examination shall be conducted for entire syllabus. The break up is as under:</p> <p>Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.</p> <p>Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.</p>	03 Hours	60 Marks

PRACTICAL/TUTORIAL

i. Daily evaluation of practical's/tutorials/Viva voce/Records etc.	10 Marks for Continuous assessment
ii. Final Examination Note: The BOS shall device the mechanism of Final examination.	15 Marks for Final examination

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SEMESTER II
SKILL ENHANCEMENT COURSE
(Examination to be held in May 2026, 2027, 2028)

Course Code: USEFST-211

Course Title: Technology of Processing of Fruits and Vegetables

Credits: 3 (Theory: 1 Credit + Practical: 2 Credits)

Maximum Marks: Theory = 75 (25 Theory + 50 Practical)

Course Outcomes: By the end of the course, students will be able to:

1. Describe the composition of fruits and vegetables and the causes of their spoilage.
2. Explain the principles and techniques used in the preservation and processing of fruits and vegetables.
3. Demonstrate practical skills in preparing various processed fruit and vegetable products using appropriate preservation methods.
4. Develop an entrepreneurial mindset by exploring value-added products from fruits and vegetables.

THEORY (1 Credit)

Unit-I

- History and need of preservation, reasons of spoilage.
- Principles and methods of fruits and vegetables preservation:
 - Low temp. preservation
 - High temp. preservation
 - Dehydration (Sun drying & mechanical dehydration)

Unit-II

- Preservation of fruit juices (pasteurization, sterilization, chemically preserved with sugars, freezing, drying, carbonation).
- Processing of Squash, Cordials, Nectar.

Unit-III

- Preparation of Jams, Jelly, Marmalades
- Preparation of Chutney, Sauce, Puree
- Preparation Pickles, Preserves Squash, Cordials, Nectar and Candied fruits

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SEMESTER II
SKILL ENHANCEMENT COURSE
(Examination to be held in May 2026, 2027, 2028)

Course Code: USEFST-211

Course Title: Technology of Processing of Fruits and Vegetables

PRACTICAL (2 Credits)

1. To carry out the moisture removal in foods by drying/Dehydration techniques
2. To perform the rehydration tests for the dried samples of vegetables.
3. Preparation of Squash/Cordials/Nectar
4. Preparation of Jams/Jelly/Marmalades
5. Preparation of Chutney/Sauce/Puree
6. Preparation Pickle

REFERENCES:

1. Cruss, W. V. (2004). *Commercial fruit and vegetable products* (Special Indian ed.). Agrobios India.
2. Fellows, P. J. (2009). *Food processing technology: Principles and practice* (3rd ed.). Woodhead Publishing.
3. Girdhari Lal, Siddappa, G. S., & Tandon, G. L. (2010). *Preservation of fruits and vegetables*. Indian Council of Agricultural Research (ICAR).
4. Manay, S., & Shadaksharaswamy, M. (2004). *Foods: Facts and principles* (2nd ed.). New Age International.
5. Ranganna, S. (2000). *Handbook of analysis and quality control for fruit and vegetable products* (2nd ed.). Tata McGraw-Hill.
6. Srilakshmi, B. (2015). *Food science* (6th ed.). New Age International.
7. Srivastava, R. P., & Kumar, S. (2012). *Fruit and vegetable preservation: Principles and practices* (3rd ed.). International Book Distributing Co.

SCHEME OF EXAMINATION

Description	Marks
Mid Term Examination Part-1 There will be a written examination. There will be 2 sections in the question paper with pattern as follows: Section A shall comprise of 4 short answer type questions of 2 ½ marks each, covering all three units with at least one question from each unit. The students have to attempt all the 4 questions from Section A. Section B shall comprise of a total of 6 questions with two questions from each unit. Each question shall be of 5 marks. The students have to attempt 3 questions selecting only one question from each unit.	25 marks

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Evaluation of Skills: Final Examination Part-2 The Evaluation of skills will be internal. The evaluation of Skills will be done internally through the Board of three members (including the trainer of the Course)	50 marks
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Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

**Food Science and Quality Control
Semester III
(Examination to be held in December 2027, 2028, 2029)
Multidisciplinary Course**

Course Code: UMDFST-306
Credits: 3
Maximum Marks: Theory: 75

Course Title: Food Science – Basic Concepts
Total No. of Lectures: Theory: 45hr

Course Outcomes:

- Enable the students to be familiar with various basic concepts of Food Science and Technology
- Create awareness regarding application of Food Science

Unit-I

- Food Science – Basic Concepts
- Scope, importance and constraints of food processing
- Classification of foods on the basis of shelf life, pH and origin.
- Different types of food spoilage viz: Microbial, physical, biochemical.

Unit-II

Food Microbiology:

- Microbial spoilage of different food products
- Useful Microbes in food and human health.
- Food borne diseases (Salmonellosis, Botulism, Diarrhea, and Eschrechia Coli).

Unit III

Principles of Food Preservation:

- Preservation by sugar and salt.
- Preservation by low temperature(Freezing, Refrigeration)
- Preservation by high temperature (Pasteurization, Sterilization and Aseptic).
- Preservation through moisture removal processes
- Preservation by use of irradiation.
- Preservation by use of Chemicals.

Unit IV

Food Nutrition:

- Sources and nutritional importance of: Carbohydrates. Proteins, Fats.
- Sources and functions of: Vitamins and Minerals (Calcium, Iron, Iodine, Zinc and Selenium).

Syllabi of Food Science and Quality Control for FYUP as per NEP-2020

Food Science and Quality Control

Semester III

(Examination to be held in December 2027, 2028, 2029)

Multidisciplinary Course

Course Code: UMDFST-306

Credits: 3

Maximum Marks: Theory: 75

Course Title: Food Science – Basic Concepts

Total No. of Lectures: Theory: 45hr

Text and Reference Books:

1. *Food Science by B. Srilakshmi*
2. *Food Science – Norman N. Potter, Joseph H. Hotchkiss*
3. *Food Chemistry – H D Blitz, W. Grosch*
4. *Food Chemistry and Nutrition – A.W. Duncan*
5. *Food Microbiology - William Frazier, Dannise Westhoff*

Scheme of Examination:

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies.	1½ Hours	15 Marks
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	03 Hours	60 Marks

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SEMESTER III
SKILL ENHANCEMENT COURSE
(Examination to be held in December 2026, 2027, 2028)

Course Code: USEFST-311

Course Title: Bakery Technology and Entrepreneurship

Credits: 3 (Theory: 1 Credit + Practical: 2 Credits)

Maximum Marks: Theory = 75 (25 Theory + 50 Practical)

Course Outcomes: By the end of the course, students will be able to:

1. Describe the composition of cereals and the functional role of ingredients used in bakery products.
2. Explain the physical and chemical changes that occur during the baking process.
3. Demonstrate the ability to prepare a variety of bakery products, including modifications for special dietary needs.
4. Design a small-scale bakery unit, considering equipment, hygiene standards, and entrepreneurial prospects.

THEORY (1 Credit)

Unit-I

- Present Trends - Prospects - Nutrition facts of Bakery.
- Wheat: Structure and Composition of wheat, Wheat products - Whole wheat flour, Maida, semolina, Role of Gluten
- Raw materials used and their role in Bakery – Flour, Yeast, Sugar, Fats, Salt, Additives

Unit-II

- Methods for preparation of: Bread, Biscuits, Cakes & Pastries
- Modification of bakery products for people with special nutritional requirements e.g. high fibre, low sugar, low fat, gluten free bakery products.

Unit-III

- Setting up of a Bakery Unit:
 - Bakery equipment required
 - Bakery norms and Standards,
 - Illumination and ventilation
 - Cleaning & sanitization

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SYLLABI OF FOOD SCIENCE AND QUALITY CONTROL FOR FYUP AS PER NEP-2020

SEMESTER III
SKILL ENHANCEMENT COURSE
(Examination to be held in December 2026, 2027, 2028)

Course Code: USEFST-311

Course Title: Bakery Technology and Entrepreneurship

PRACTICAL (2 Credits)

1. Determination of the Moisture Content in Wheat Flour.
2. Determination of the Total Ash Content in Wheat Flour.
3. Determination of the Gluten Content.
4. Preparation of Bread
5. Preparation of Biscuits
6. Preparation of Cake

REFERENCES

1. Dendy, D. A. V., & Dobraszczyk, B. J. (2001). *Cereals and cereal products: Chemistry and technology*. Springer.
2. Fellows, P. J. (2016). *Food processing technology: Principles and practice* (4th ed.). Woodhead Publishing.
3. Hanneman, L. J. (1980). *Bakery flour confectionery*. McGraw-Hill Publishing.
4. Matz, S. A. (1992). *Bakery technology and engineering* (3rd ed.). CBS Publishers & Distributors.
5. Matz, S. A. (1991). *Chemistry and technology of cereal foods and feed* (2nd ed.). CBS Publishers & Distributors.
6. Rosentrater, K. A., & Evers, A. D. (2018). *Kent's technology of cereals: An introduction for students of food science and agriculture* (5th ed.). Woodhead Publishing.

SCHEME OF EXAMINATION

Description	Marks
Mid Term Examination Part-1 There will be a written examination. There will be 2 sections in the question paper with pattern as follows: Section A shall comprise of 4 short answer type questions of 2 ½ marks each, covering all three units with at least one question from each unit. The students have to attempt all the 4 questions from Section A. Section B shall comprise of a total of 6 questions with two questions from each unit. Each question shall be of 5 marks. The students have to attempt 3 questions selecting only one question from each unit.	25 marks
Evaluation of Skills: Final Examination Part-2 The Evaluation of skills will be internal. The evaluation of Skills will be done internally through the Board of three members (including the trainer of the Course)	50 marks

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