



GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
(Established by State Legislature Act 17 of 1995)
'A+' Grade, NAAC Accredited State Govt. University

Acad./AC-III/BOS&R-1/2026/ 2594
Dated: 14/5/26

To

The Controller of Examinations
GJUS&T, Hisar.

Sub: Approval of scheme of examinations and syllabi of various MOOCs courses offered by the department of Food Technology (6th and 8th semester) for B.Tech. Food Technology programme being run in University Teaching Departments.

Sir,

I am directed to inform you that the Vice-Chancellor, on the recommendations of Dean, Faculty of Engineering & Technology on dated 21.04.2026, is pleased to approve the approved the syllabi of MOOCs courses "Food Laws and Standards" having course code "PEC-FT302-T(MOOC)" and courses "Cooling Technology: Why and How Utilized in Food Processing and allied industries" having course code "PEC-FT304-T(MOOC)" in 6th semester "Food Preservation Technology" having course code "PEC-FT402-T(MOOC)" and "Economics of Food" having course code PEC-FT404-T(MOOC) in 8th semester for B.Tech. Food Technology programme, under Section 11(5) of the University Act, 1995 in anticipation of approval of the Academic Council.

A copy of the scheme of examinations and syllabi of above said MOOC course are enclosed herewith. You are therefore, requested to take further necessary action accordingly.

Yours faithfully

DA: As above

Aarshi
14/5/26
Assistant Registrar (Academic)
for Dean Academic Affairs

Endst. No. Acad./AC-III/BOS&R-1/2026/ 2595-98

Dated: 14/5/26

A copy of the above is forwarded to the following for information and necessary action:-

1. Dean, Faculty of Engineering & Technology, GJUST, Hisar.
2. Chairperson, Department of Food Technology, GJUST, Hisar. She is requested to get upload the scheme of examinations and syllabi of above said MOOC course being run in University Teaching Departments on the website of the University on the priority basis.
3. OSD to Vice-Chancellor (for kind information of the Vice-Chancellor), GJUST, Hisar.
4. P.A. to Registrar (for kind information of the Registrar), GJUST, Hisar.

Aarshi
14/5/26
Assistant Registrar (Academic)



Department of Food Technology
Guru Jambheshwar University of Science & Technology
Hisar, Haryana
Choice Based Credit System Scheme
SEMESTER VI

Sr. No.	Category	Course Code	Course Title	Hours per week			Credits	Marks Distribution	
				L	T	P		Internal	External
1	Humanities and Social Sciences including Management Course	HSMC302-T	Fundamentals of Management for Engineers	2	0	0	2	30	70
2	Basic Sciences Courses	BSC-FT302-T	Statistics for Food Technologists	2	1	0	3	30	70
3	Professional Core Course	PCC-FT302-T	Technology of Milk and Milk Products	3	0	0	3	30	70
4	Professional Core Course	PCC-FT302-P	Technology of Milk and Milk Products Lab	0	0	4	2	50	50
	Professional Core Course	PCC-FT304-T	Fermentation Technology	3	0	0	3	30	70
	Professional Core Course	PCC-FT304-P	Fermentation Technology Lab	0	0	2	1	50	50
5	Professional Elective Course	PEC-FT302-T(i)	Professional Elective – I	3	0	0	3	30	70
		PEC-FT302-T(ii)	Bioprocess Engineering						
		PEC-FT302-T(iii)	Technology of Beverages						
		PEC-FT302-T (MOOC)	Specialty Foods				4	30	70
6	Professional Elective Course	PEC-FT304-T(i)	Professional Elective – II	3	0	0	3	30	70
		PEC-FT304-T(ii)	Technology of Pulses and Oilseeds						
		PEC-FT304-T(iii)	Technology of Spices and Herbs						
		PEC-FT304-T (MOOC)	Dairy Process Engineering						
8	OPEN ELECTIVE COURSE-II		Cooling Technology: Why and How utilized in Food Processing and allied industries	3	0	0	3	30	70
			Open Elective-II (from any other Department)	3	0	0	3	30	70
			Total				23		
	Open Elective Course	OE-FT-392-T	Open Elective-II (for the students of other teaching departments) Food Safety, Quality and Regulations	3	0	0	3	30	70

Students are required to do summer internship/training of 4-6 weeks during break following 6th semester which will be evaluated during 7th semester.

SEMESTER VIII

Sr. No.	Category	Course Code	Course Title	Hours per week			Credits	Marks Distribution	
				L	T	P		Internal	External
1	Professional Core Course	PCC-FT402-T	Food Packaging	3	0	0	3	30	70
2	Professional Core Course	PCC-FT402-P	Food Packaging Lab	0	0	2	1	50	50
3	Professional Elective Course	PEC-FT402-T(i)	Professional Elective - V	3	0	0	3	30	70
		PEC-FT402-T(ii)	Baking and Confectionary Technology						
		PEC-FT402-T(iii)	Technology of Fats and Oils						
		PEC-FT402-T(iii)	Snack Food Technology						
		PEC-FT402-T (MOOC)	Food Preservation Technology				3	30	70
4	Professional Elective Course	PEC-FT404-T(i)	Professional Elective - VI	3	0	0	3	30	70
		PEC-FT404-T(ii)	Introduction to Food Additives						
		PEC-FT404-T(iii)	Technology of Traditional Foods						
		PEC-FT404-T(iii)	Functional Foods and Nutraceuticals				3	30	70
		PEC-FT404-T (MOOC)	Economics of Food						
5	Project	PROJ-FT2	Project-2	0	0	12	6		100
				Total			16		
OR									
1	In-Plant Training	FTIT-3	In-Plant Training-III	(4-6 Months)			10		*
2	Two courses each of 03 credit (MOOCs through NPTEL/SWAYAM platform or from core/elective courses offered in 8 th semester)								
				Total			16		

Chairperson
A. S. S. S.

Department of Food Technology
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SEMESTER VI

Course Code: PEC-FT302-T
(MOOC)

Course Title: Food Laws and Standards

Hours per week: 4+0+0

Credits: 4

Course Assessment Method: Max. Marks: 100

(Internal: 30; External: 70)

Note for Paper Setter:

The end semester examination will be of 70 marks. Nine questions are to be set by the examiner. Question number one (01) is compulsory and will be based on entire syllabus i.e. all four units. It will contain seven (07) short answer type questions of two (02) marks each. In addition, eight more questions are to be set unit-wise comprising two questions from each unit. All questions including question number one shall carry equal marks i.e. fourteen (14) marks each. The candidates are required to attempt five questions in total including 1st compulsory question and four more questions by selecting one question from each unit.

RBT Level	Course Outcomes: After the completion of the course, the students will be able to:	
L1: Remember	CO1	Describe concept of laws, standards and systems related to food quality and safety.
L2: Understand	CO2	Explain principles and mechanism related to food safety and quality management systems.
L3: Apply	CO3	Use various regulations as per the requirement of dynamic food sector.
L5: Evaluate	CO4	Assess various factors that affect food quality and safety for obtaining good quality and safe foods.
L6: Create	CO5	Prescribe improvement in existing regulations and management systems for food industries.

UNIT-I

Introduction: Food Science, Food Microbiology, Basics of Food Safety, Indian Food Regulatory Regime: Repealed Acts and Orders, Prevention of Food Adulteration Act and Rules (PFA) and Orders under Essential Commodities Act, Food Safety and Standard Act, 2006, Food Safety Regulation and Rules: Licensing and Registration of Food Businesses ;Food Products Standards and Food Additives ; Prohibition and Restriction of Sales; Packaging and Labelling; Contaminants, Toxins and Residues; Laboratory and Sampling Analysis



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Guru Jambheshwar University of
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UNIT-II

Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food; Food Recall Procedure; Import; Approval for Non-Specific Food and Food Ingredients; Organic Food; Alcoholic Beverages; Fortification of Food, Food Safety Auditing; Recognition and Notification of Laboratories; Advertising and Claims; Packaging; Recovery and Distribution of Surplus food; Recruitment and Appointment; Food Safety and Standards Rules.

UNIT-III


Sanitary and Hygienic requirements: Part I - Petty Food Business Operators; Part -II General Requirements for Food Business Operators, Part -III Milk and Milk products; Part- IV Meat and meat Products, Part- V : Catering, Food Safety Guidelines during COVID 19, Food Safety and Management System: Guidance Documents of FSSAI, Food Testing: Methods of Analysis of various Products, Other Initiatives of FSSAI : Training- FoSTaC, Safe and Nutritious Food (SNF), Testing, online platforms, and other activities related to awareness and training

UNIT-IV

Codex Alimentarius Commission (CAC): Structure of Codex, Scientific Basis, Harmonization of National Standard with Codex, WTO Implications: SPS and TBT agreement, Other International Standard Setting Bodies: ISO, OIE, IPPC, AOAC, ASTM, EU and USFDA, Food Safety and Quality Requirements: HACCP, ISO 22000, GFSI and BRC, National Agencies for Implementation of International Food Laws and Standards, Foreign Trade Policy, Export (Quality Control and Inspection) Act, 1963, Export Inspection Council, Export Promotional Bodies: APEDA, MPEDA, CEPC, Plant and Animal Quarantine, Customs Act and Import Control Regulations, Legal Metrology Act, 2019, Voluntary National Standards: BIS and AGMARK, Other Laws Related to Food Products: Consumer Protection Act, Environment Protection Act

Recommended Readings:

- Course MVP-002: Food Laws and Standards of “PG Diploma in Food Safety and Quality Management” programme being offered by School of Agriculture, IGNOU.
- Food Safety and Standards Act 2006 and Regulations 2011.
- <https://www.fssai.gov.in/home>
- Codex e-Learning Centre
(http://www.fao.org/ag/agn/agns/capacity_elearning_codex_en.asp)



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SEMESTER VI

Course Code: PEC-FT304-T
(MOOC)

Course Title: Cooling
Technology: Why and how
utilized in Food Processing and
Allied Industries

Hours per week: 3+0+0

Credits: 3

Course Assessment Method: Max. Marks: 100

(Internal: 30; External: 70)

Note for Paper Setter:

The end semester examination will be of 70 marks. Nine questions are to be set by the examiner. Question number one (01) is compulsory and will be based on entire syllabus i.e. all four units. It will contain seven (07) short answer type questions of two (02) marks each. In addition, eight more questions are to be set unit-wise comprising two questions from each unit. All questions including question number one shall carry equal marks i.e. fourteen (14) marks each. The candidates are required to attempt five questions in total including 1st compulsory question and four more questions by selecting one question from each unit.

RBT Level	Course Outcomes: After the completion of the course, the students will be able to:	
L1: Remember	CO1	Describe principles of cooling and refrigeration systems.
L2: Understand	CO2	Explain thermodynamic cycles used in refrigeration.
L3: Apply	CO3	Apply cooling load and psychrometric calculations.
L5: Evaluate	CO4	Analyze performance of refrigeration systems
L6: Create	CO5	Design efficient cooling and cold storage systems

UNIT-I

Fundamentals of Cooling and Psychrometry: Fundamentals of food processing and preservation using low temperature, Heat transfer principles: conduction, convection, radiation, Cooling load calculations: product load, heat of respiration, transmission losses, Psychrometry: properties of moist air, humidity, dew point, enthalpy, Use of psychrometric charts in food processing industries, Importance of cooling in maintaining food quality and safety


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UNIT-II

Thermodynamics and refrigeration cycles: Basic concepts of thermodynamics and laws, Carnot cycle and its limitations, Reverse Carnot cycle and refrigeration principles, Coefficient of Performance (COP), Vapour compression refrigeration system (VCRS): working principle, Types of refrigerants and environmental concerns

UNIT-III

Refrigeration systems and components: Components of refrigeration systems: compressor, condenser, evaporator, expansion devices; Types and working of compressors, Heat exchangers used in refrigeration, Air conditioning systems in food industries, Performance evaluation and efficiency of refrigeration systems

UNIT-IV

Freezing, Cold storage and Applications: Principles of freezing and freeze drying, Freezing methods: slow freezing, quick freezing, IQF, Cold storage design and management, Cold chain logistics and transportation of food, Ice cream as a low-temperature product: structure, processing, and storage

Recommended Readings:

- R.C. Arora – *Refrigeration and Air Conditioning*
- ASHRAE – *ASHRAE Handbook* C.J. Geankoplis – *Transport Processes and Separation Process Principles*
- C.P. Arora – *Refrigeration and Air Conditioning*
- A.K. Datta – *Transport Phenomena in Food Processing*


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SEMESTER VIII

Course Code: PEC-FT402-T

(MOOC)

Course Title: Food Preservation
Technology

Hours per week: 3+0+0

Credits: 3

Course Assessment Method: Max. Marks: 100

(Internal: 30; External: 70)

Note for Paper Setter:

The end semester examination will be of 70 marks. Nine questions are to be set by the examiner. Question number one (01) is compulsory and will be based on entire syllabus i.e. all four units. It will contain seven (07) short answer type questions of two (02) marks each. In addition, eight more questions are to be set unit-wise comprising two questions from each unit. All questions including question number one shall carry equal marks i.e. fourteen (14) marks each. The candidates are required to attempt five questions in total including 1st compulsory question and four more questions by selecting one question from each unit.

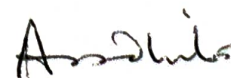
RBT Level	Course Outcomes: After the completion of the course, the students will be able to:	
L1: Remember	CO1	Describe principles of food preservation and spoilage
L2: Understand	CO2	Explain preservation techniques for different food systems
L3: Apply	CO3	Apply preservation methods to extend shelf life
L5: Evaluate	CO4	Evaluate effectiveness of preservation technologies
L6: Create	CO5	Develop improved preservation strategies for food safety

UNIT-I

Principles of Food Preservation: Basic principles of food preservation and shelf-life extension, Traditional methods of food preservation, Bio-preservation and chemical preservatives, Microorganisms in food: characteristics and growth, Food spoilage and control mechanisms, Food-borne diseases and prevention, Role of proteins and enzymes in food preservation, Preservation using salt and sugar

UNIT-II

Fruit and Vegetables Processing: Classification and composition of fruits and vegetables, Processing methods: dehydration, freezing, concentration, Preparation of squashes, cordials, and beverages, Pectin chemistry and its role in jams and jellies, Marmalades and fruit



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spreads, Enzymatic changes in fruit processing, Value addition and product diversification, Bottling and freezing of products

UNIT-III


Meat, Fish and Poultry Preservation: Introduction to refrigeration and freezing, Pressure-enthalpy relationships in freezing, Meat preservation: chilling, freezing, irradiation, thermal processing, Fish preservation: canning, curing, smoking, Poultry and egg preservation techniques, Microbial spoilage of animal products, Industrial practices and processing techniques, Waste management in meat and fish processing

UNIT-IV

Advanced Preservation and Food Safety: Freezing, dehydration, and modern preservation technologies, Post-harvest losses and their management, Sterilization equipment and techniques, Laminar Air Flow (LAF) cabinet and clean room concepts, Identification of hazards in food processing, Sanitation and use of sanitizers, Food safety and quality control measures

Recommended Readings:

- Norman N. Potter – *Food Science*
- P.J. Fellows – *Food Processing Technology*
- W.C. Frazier – *Food Microbiology*
- R. Paul Singh – *Introduction to Food Engineering*
- Dennis R. Heldman – *Food Preservation Techniques*


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SEMESTER VIII

Course Code: PEC-FT404-T

(MOOC)

Course Title: Economics of Food

Hours per week: 3+0+0

Credits: 3

Course Assessment Method: Max. Marks: 100

(Internal: 30; External: 70)

Note for Paper Setter:

The end semester examination will be of 70 marks. Nine questions are to be set by the examiner. Question number one (01) is compulsory and will be based on entire syllabus i.e. all four units. It will contain seven (07) short answer type questions of two (02) marks each. In addition, eight more questions are to be set unit-wise comprising two questions from each unit. All questions including question number one shall carry equal marks i.e. fourteen (14) marks each. The candidates are required to attempt five questions in total including 1st compulsory question and four more questions by selecting one question from each unit.

RBT Level	Course Outcomes: After the completion of the course, the students will be able to:	
L1: Remember	CO1	Describe the basic concepts of food economics, consumption, and expenditure patterns
L2: Understand	CO2	Explain food planning strategies and government food distribution systems
L3: Apply	CO3	Apply economic principles in analysing food policies and programs
L5: Evaluate	CO4	Evaluate the effectiveness of food security and nutrition programs
L6: Create	CO5	Propose strategies for improving food systems and consumer awareness

UNIT-I

Food consumption and expenditure: Concept of food economics and its importance, Household food consumption patterns (rural and urban differences), Factors affecting food expenditure: income, price, culture, availability
Engel's law and its relevance to food consumption, Planning for food production at household and national level, Role of agriculture in food economy, Public Distribution System (PDS): objectives, structure, functioning, and challenges


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UNIT-II

Government Policies and Agricultural Programs: Overview of Indian agricultural policies and reforms, Role of government in food production and distribution, Minimum Support Price (MSP) and procurement system, Government schemes for agricultural development, Poultry development programs: scope and economic importance, Pisciculture and aquaculture programs in India, Role of subsidies and incentives in food production

UNIT-III

Dairy and Nutrition Programs: Dairy development programs: Operation Flood and cooperative movement, Role of National Dairy Development Board (NDDB), Supplementary feeding programs: ICDS, Mid-Day Meal Scheme, Nutritional security and food supplementation strategies, Role of dairy and animal husbandry in rural economy, Impact of government nutrition programs on public health

UNIT-IV

Food Safety, Consumer Awareness and Sustainability: Protection of food supplies and food security issues, Food adulteration: types, causes, detection, and prevention, Consumer rights and responsibilities, Consumer education and awareness programs, Food labelling and quality standards, Sustainable food systems and reduction of food waste

Recommended Readings:

- Acharya, S.S. – *Agricultural Marketing in India*
- Ramasamy, C. – *Agricultural Economics*
- Government of India – *National Food Security Act Reports*
- FAO – *Food Security and Nutrition Reports*
- Dantwala, M.L. – *Indian Agricultural Development*



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