



MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2025 Admission Onwards

SYLLABUS

SIGNATURE COURSE

Name of the College	Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki								
Faculty/ Discipline	Food Technology and Quality Assurance								
Programme	BSc (Hons) Food Technology and Quality Assurance								
Course Coordinator	Dr Johnykutty J Ozhukayil								
Contributors	Ms. Aneesha Suresh								
Course Name	Introduction to Food Packaging Technology and Quality Control Test Methodologies								
Type of Course	DSE								
Specialization title	Food Packaging Technology & Quality Control Test Methodologies								
Course Code	MG3DSEFTQA00								
Course Level	200								
Course Summary	This course provides knowledge on food packaging technology and quality control test methodologies used in the food industry. It covers the fundamentals of food packaging materials, packaging methods, packaging machinery, package design and labelling systems. The course also includes physical, chemical, microbiological and instrumental quality control tests for food and packaging materials. Students will learn about shelf-life evaluation, food safety standards, quality assurance systems and recent developments in food packaging and testing technologies. The course helps learners develop practical, analytical and technical skills required for ensuring food quality, safety and effective packaging operations in food industries.								
Semester	3	Credits	4						
Course Details	<table><tr><td>Learning Approach</td><td>Lecture</td><td>Total Hours</td></tr><tr><td>Credits</td><td>4</td><td>60</td></tr></table>			Learning Approach	Lecture	Total Hours	Credits	4	60
	Learning Approach	Lecture	Total Hours						
Credits	4	60							
Pre-requisites, if any									

Course Outcomes (CO)

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
1	Understand the basic concepts, functions and importance of food packaging materials and quality control systems used in food industries	U	PO1, PO2
2	Apply suitable food packaging methods and packaging machinery operations for preservation and safe handling of food products.	A	PO2, PO3
3	Analyze package design, labelling requirements and barcode systems used in food packaging industries	An	PO3
4	Apply physical, chemical, microbiological and instrumental quality control test methods for evaluating food and packaging materials.	A	PO4

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
5	Analyze shelf-life studies, food packaging standards, quality assurance systems and recent trends in food packaging technology.	An	PO5

*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	2	-	-	-	-	-	-	-	-
CO 2	-	3	2	-	-	-	-	-	-	-
CO 3	-	-	3	-	-	-	-	-	-	-
CO 4	-	-	-	3	-	-	-	-	-	-
CO 5	-	-	-	-	2	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Introduction to Food Packaging-			
	1.1	Nanocomposite packaging materials, High-barrier packaging materials	5	["1"]
	1.2	- Seaweed-based packaging films - Mushroom packaging materials	5	["1"]
	1.3	- Compostable packaging materials - Self-healing packaging material	5	["1"]
2	Packaging Methods and Machinery			
	2.1	- IoT-based smart packaging - QR code & digital packaging system	5	["2"]
	2.2	- AI in packaging design and quality control - Smart sensors in packaging	5	["2"]
	2.3	- Compostable packaging materials - Self-healing packaging material	5	["3"]
3	Quality Control Test Methods			
	3.1	- Introduction to food quality control - Quality characteristics of foods - Factors affecting food quality	5	["4"]
	3.2	- Quality assurance vs quality control - Food quality standards and specifications	5	["4"]
	3.3	- Good Manufacturing Practices (GMP) - Good Hygiene Practices (GHP) - Total Quality Management (TQM) in food industry	5	["4"]

Module	Units	Course Description	Hrs	CO No.
4	Advanced Packaging and Quality Assurance			
	4.1	• Sampling techniques in food analysis • Physical methods of quality evaluation • Chemical methods of quality evaluation	5	["5"]
	4.2	• Microbiological quality assessment • Sensory evaluation methods • Instrumental methods in food analysis	5	["5"]
	4.3	• Statistical quality control • Quality auditing and documentation	5	["5"]

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Module 1&2 - Lecturing , ICT Enabled Learning Module 3 & 4- Lecturing, ICT Enabled Learning
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Assessment Types	MODE OF ASSESSMENT Mode of Assessment: Theory
	A. Continuous Comprehensive Assessment (CCA) • Theory - 30 Marks □ Assignments □ Class tests □ Seminars
	B. End Semester Evaluation (ESE) • Theory - 70 Marks Assessment Methods - Theory Total Marks 70 Assessment Methods Duration of Examination 2 hours Pattern of examination for Theory Different parts of written examination {Part - A, B, C Duration of Examination - 2.00 Hrs Pattern of examination for Theory - Non-MCQ Different parts of written examination - Part - A , B , C Answer Type: ◦ PART - A ◦ Short answer - (10 out of 12) - $10 \times 2 = 20$ ◦ PART - B ◦ Short Essays - (6 out of 8) - $6 \times 5 = 30$ ◦ PART - C ◦ Essays - (2 out of 4) - $2 \times 10 = 20$

References

1. Nielsen, S. S. (2017) Food Analysis, 5th Edition, Springer, New York.
2. Skoog, D. A., Holler, F. J. and Crouch, S. R. (2018) Principles of Instrumental Analysis, 7th Edition, Cengage Learning.
3. AOAC (2019) Official Methods of Analysis, 21st Edition, Association of Official Analytical Chemists, Washington DC.
4. Jay, J. M., Loessner, M. J. and Golden, D. A. (2005) Modern Food Microbiology, 7th Edition, Springer, New York.
5. FSSAI (2016) Manual of Methods of Analysis of Foods, Food Safety and Standards Authority of India, New Delhi.
6. Gordon L. Robertson. 2014. Food Packaging: Principles and Practice, 3rd Ed. CRC Press, Boca Raton FL, USA.
7. Robertson, (1998), Principles of Food Packaging Press, USA
8. Scharow, S., and Griffin, R.C. (1980). Principles of Food Packaging, 2nd Edition, AVI Publications Co. Westport, Connecticut, USA.
9. Rajia Ahvenainen. 2003. Novel Food Packaging Techniques. CRC-Woodhead Publishing Ltd., Cambridge, England.
10. Richard Coles, Berek McDowell and Mark J. Kirwan. 2003. Food Packaging Technology. Blackwell Publishing Ltd., Oxford, UK

Suggested Readings

1. Pomeranz, Y. and Meloan, C. E. (2000) Food Analysis: Theory and Practice, Springer, New York.
2. Fellows, P. (2017) Food Processing Technology: Principles and Practice, 4th Edition, Woodhead Publishing.
3. Ranganna, S. (2009) Handbook of

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Affidavit

- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki and Dr Johnykutty J Ozhukayil, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki, agree to appoint a new course coordinator for the proposed Food Packaging Technology & Quality Control Test Methodologies in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki and Dr Johnykutty J Ozhukayil, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.



MGU-UGP (HONOURS)

Syllabus

	MAHATMA GANDHI UNIVERSITY Kottayam, Kerala Undergraduate Programmes (HONOURS) 2025 Admission Onwards
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SYLLABUS									
SIGNATURE COURSE									
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Faculty/ Discipline	Food Technology and Quality Assurance								
Programme	BSc (Hons) Food Technology and Quality Assurance								
Course Coordinator	Dr Johnykutty J Ozhukayil								
Contributors	Ms. Aneesha Suresh								
Course Name	Advanced Food Packaging and Quality Evaluation Techniques								
Type of Course	DSE								
Specialization title	Food Packaging Technology & Quality Control Test Methodologies								
Course Code	MG4DSEFTQA00								
Course Level	200								
Course Summary	This course provides knowledge on food packaging technology and quality control test methodologies used in the food industry. It covers the fundamentals of food packaging materials, packaging methods, packaging machinery, package design and labelling systems. The course also includes physical, chemical, microbiological and instrumental quality control tests for food and packaging materials. Students will learn about shelf-life evaluation, food safety standards, quality assurance systems and recent developments in food packaging and testing technologies. The course helps learners develop practical, analytical and technical skills required for ensuring food quality, safety and effective packaging operations in food industries.								
Semester	4	Credits	4						
Course Details	<table><tr><td>Learning Approach</td><td>Lecture</td><td>Total Hours</td></tr><tr><td>Credits</td><td>4</td><td>60</td></tr></table>			Learning Approach	Lecture	Total Hours	Credits	4	60
	Learning Approach	Lecture	Total Hours						
Credits	4	60							
Pre-requisites, if any									

Course Outcomes (CO)

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
1	Understand advanced packaging materials, biodegradable packaging systems and sustainable packaging concepts used in food industries.	U	PO1, PO2
2	Analyze the principles and applications of smart packaging and active packaging systems for food preservation and quality maintenance.	A	PO2, PO3
3	Apply packaging operations, storage systems and cold chain management techniques for processed and packaged foods.	An	PO3
4	Apply instrumental, microbiological and sensory evaluation techniques for food quality assessment and quality control.	A	PO4

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
5	Analyze food laws, quality assurance systems, HACCP procedures and emerging technologies used in food packaging and quality management.	An	PO5

*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	2	-	-	-	-	-	-	-	-
CO 2	-	3	2	-	-	-	-	-	-	-
CO 3	-	-	3	-	-	-	-	-	-	-
CO 4	-	-	-	3	-	-	-	-	-	-
CO 5	-	-	-	-	2	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Advanced Packaging Materials and Systems			
	1.1	Advanced bio-based packaging materials, Nanocomposite and hybrid packaging materials.	5	["1"]
	1.2	Edible films, edible coatings, Functional barrier materials.	5	["1"]
	1.3	High-performance multilayer packaging, Emerging biodegradable polymers.	5	["2"]
2	Food Processing and Packaging Integration			
	2.1	Internet of Things (IoT) in food packaging, Artificial Intelligence in packaging design.	5	["3"]
	2.2	Blockchain for packaging traceability, RFID and NFC technologies.	5	["3"]
	2.3	Digital printing and interactive packaging, Smart authentication systems.	5	["3"]
3	Advanced Quality Control and Food Analysis			
	3.1	Food Safety Risk Assessment and Risk Analysis, Food Safety Risk Communication.	5	["4"]
	3.2	Validation and Verification of Food Safety Control Measures, Environmental Monitoring Program (EMP) in Food Industries, Food Defense and Food Fraud Prevention.	5	["4"]
	3.3	Food Traceability and Product Recall Management, Crisis Management in Food Industries, Root Cause Analysis (RCA) and Corrective & Preventive Actions (CAPA).	5	["4"]

Module	Units	Course Description	Hrs	CO No.
4		Food Laws, Standards and Emerging Technologies		
	4.1	Laboratory Quality Management System , Advanced Instrumental Techniques for Food Quality Analysis .	5	["5"]
	4.2	Rapid Methods for Food Quality and Safety Testing, Automation and Digitalization in Food Quality Control	5	["5"]
	4.3	Future Trends and Innovations in Food Quality Management	5	["5"]

Teaching and Learning Approach	Classroom Procedure (Mode of transaction)
	Module 1&2 – Lecturing , ICT Enabled Learning Module 3 & 4- Lecturing, ICT Enabled Learning

Assessment Types	MODE OF ASSESSMENT Mode of Assessment: Theory
	A. Continuous Comprehensive Assessment (CCA) • Theory – 30 Marks ☐ Assignments ☐ Class tests ☐ Seminars
	B. End Semester Evaluation (ESE) • Theory – 70 Marks Assessment Methods – Theory Total Marks 70 Assessment Methods Duration of Examination 2 hours Pattern of examination for Theory Different parts of written examination {Part – A, B, C Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: • PART - A • Short answer - (10 out of 12) – 10 × 2 = 20 • PART - B • Short Essays - (6 out of 8) – 6 × 5 = 30 • PART - C • Essays - (2 out of 4) – 2 × 10 = 20

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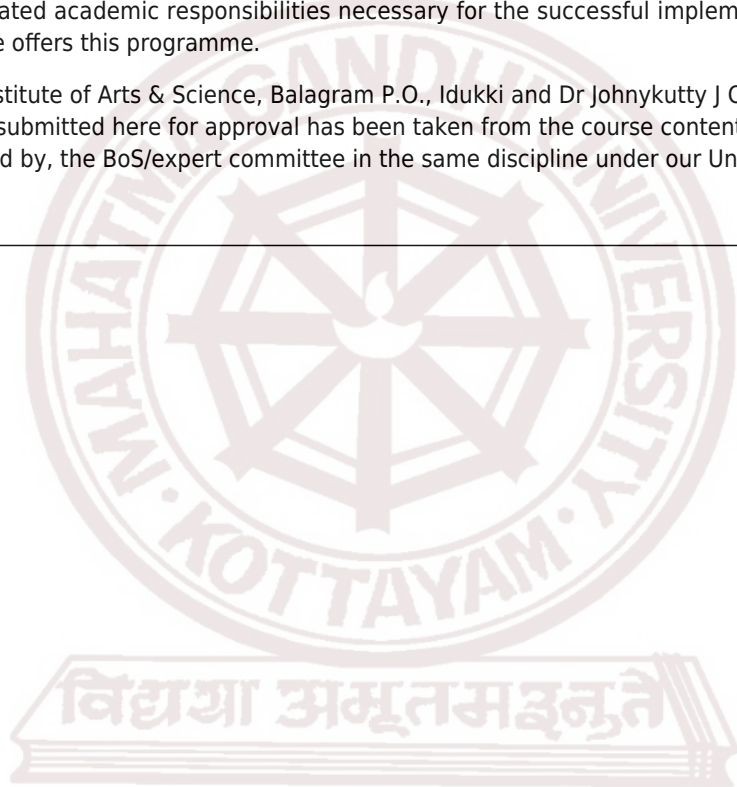
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MGU-UGP (HONOURS)

Syllabus



MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2025 Admission Onwards

SYLLABUS

SIGNATURE COURSE

Name of the College	Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki								
Faculty/ Discipline	Food Technology and Quality Assurance								
Programme	BSc (Hons) Food Technology and Quality Assurance								
Course Coordinator	Dr Johnykutty J Ozhukayil								
Contributors	Ms. Aneesha Suresh								
Course Name	Innovative Food Packaging and Advanced Quality Management								
Type of Course	DSE								
Specialization title	Food Packaging Technology & Quality Control Test Methodologies								
Course Code	MG5DSEFTQA00								
Course Level	300								
Course Summary	This course provides knowledge on food packaging technology and quality control test methodologies used in the food industry. It covers the fundamentals of food packaging materials, packaging methods, packaging machinery, package design and labelling systems. The course also includes physical, chemical, microbiological and instrumental quality control tests for food and packaging materials. Students will learn about shelf-life evaluation, food safety standards, quality assurance systems and recent developments in food packaging and testing technologies. The course helps learners develop practical, analytical and technical skills required for ensuring food quality, safety and effective packaging operations in food industries.								
Semester	5	Credits	4						
Course Details	<table><tr><td>Learning Approach</td><td>Tutorial</td><td>Total Hours</td></tr><tr><td>Credits</td><td>4</td><td>60</td></tr></table>			Learning Approach	Tutorial	Total Hours	Credits	4	60
	Learning Approach	Tutorial	Total Hours						
Credits	4	60							
Pre-requisites, if any									

Course Outcomes (CO)

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
1	Understand different packaging materials, eco-friendly packaging systems and recent innovations used in modern food packaging.	U	PO1, PO2
2	Apply appropriate packaging selection and design principles for different food products in industrial applications.	A	PO2, PO3
3	Apply packaging machinery operations and evaluate packaging material testing methods used in food industries.	A	PO3
4	Analyze advanced food quality evaluation techniques including instrumental, microbiological and sensory methods.	An	PO3

Number of COs			5
CO No.	Expected Course Outcome	Learning Domains *	PO No
5	Analyze food safety management systems, regulatory standards and emerging technologies in food packaging and quality control.	An	PO5

*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	2	-	-	-	-	-	-	-	-
CO 2	-	3	2	-	-	-	-	-	-	-
CO 3	-	-	3	-	-	-	-	-	-	-
CO 4	-	-	3	-	-	-	-	-	-	-
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'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Emerging Packaging Materials and Technologies			
	1.1	Nano-sensor integrated packaging systems Real-time freshness monitoring technologies	5	["1"]
	1.2	Self-healing and responsive packaging materials Temperature-sensitive smart packaging	5	["1"]
	1.3	Digital twin technology in packaging systems Autonomous smart packaging solutions	5	["1"]
2	Packaging Engineering and Industrial Applications			
	2.1	Machine learning in packaging optimization Predictive packaging performance analysis	5	["2"]
	2.2	Computer vision for packaging defect detection Robotic packaging automation	5	["3"]
	2.3	Sustainable intelligent packaging systems Future trends and innovations in packaging technology	5	["3"]
3	Advanced Food Quality Evaluation Techniques			
	3.1	AI-based food safety risk prediction Predictive hazard analysis models	5	["4"]
	3.2	Real-time contamination monitoring using biosensors Smart surveillance systems in food industries	5	["4"]
	3.3	Big data analytics for traceability and crisis management Digital risk communication systems	5	["4"]

Module	Units	Course Description	Hrs	CO No.
4		Food Safety Management and Emerging Trends		
	4.1	Machine learning in quality control automation Computer vision for advanced defect detection	5	["5"]
	4.2	Digital twin and Industry 5.0 in food quality management Cloud-based laboratory quality systems	5	["5"]
	4.3	Sustainable food quality systems Future trends and innovations in food safety and quality management	5	["5"]

Teaching and Learning Approach	Classroom Procedure (Mode of transaction)
	Module 1&2 – Lecturing , ICT Enabled Learning Module 3 & 4- Lecturing, ICT Enabled Learning

Assessment Types	MODE OF ASSESSMENT Mode of Assessment: Theory
	A. Continuous Comprehensive Assessment (CCA) • Theory – 30 Marks □ Assignments □ Class tests □ Seminars
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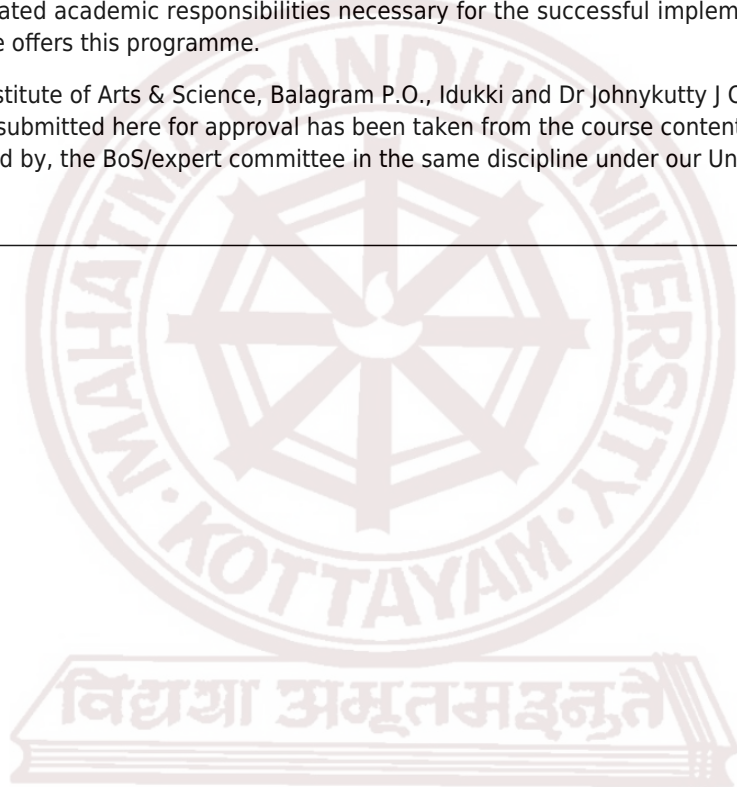
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Faculty/ Discipline	Food Technology and Quality Assurance								
Programme	BSc (Hons) Food Technology and Quality Assurance								
Course Coordinator	Dr Johnykutty J Ozhukayil								
Contributors	Ms. Aneesha Suresh								
Course Name	Advanced Food Packaging Science and Digital Food Quality Systems								
Type of Course	DSE								
Specialization title	Food Packaging Technology & Quality Control Test Methodologies								
Course Code	MG6DSEFTQA00								
Course Level	300								
Course Summary	This course provides knowledge on food packaging technology and quality control test methodologies used in the food industry. It covers the fundamentals of food packaging materials, packaging methods, packaging machinery, package design and labelling systems. The course also includes physical, chemical, microbiological and instrumental quality control tests for food and packaging materials. Students will learn about shelf-life evaluation, food safety standards, quality assurance systems and recent developments in food packaging and testing technologies. The course helps learners develop practical, analytical and technical skills required for ensuring food quality, safety and effective packaging operations in food industries.								
Semester	6	Credits	4						
Course Details	<table><tr><td>Learning Approach</td><td>Lecture</td><td>Total Hours</td></tr><tr><td>Credits</td><td>4</td><td>60</td></tr></table>			Learning Approach	Lecture	Total Hours	Credits	4	60
	Learning Approach	Lecture	Total Hours						
Credits	4	60							
Pre-requisites, if any									

Course Outcomes (CO)

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
1	Understand the molecular structure, barrier properties and functional behaviour of advanced packaging materials used in food systems.	U	PO1, PO2
2	Analyze intelligent, active and responsive packaging technologies used for food preservation and quality enhancement.	An	PO2, PO3
3	Apply engineering principles and optimization techniques in packaging design, automation and process improvement in food industries.	A	PO3
4	Analyze advanced instrumental, molecular and AI-based techniques for food quality testing and safety monitoring.	An	PO4

Number of COs		5	
CO No.	Expected Course Outcome	Learning Domains *	PO No
5	Evaluate global food safety systems, digital traceability methods and sustainable packaging innovations in modern food industries.	E	PO5

*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	2	-	-	-	-	-	-	-	-
CO 2	-	3	2	-	-	-	-	-	-	-
CO 3	-	-	3	-	-	-	-	-	-	-
CO 4	-	-	-	3	-	-	-	-	-	-
CO 5	-	-	-	-	2	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Advanced Packaging Science and Material Innovations			
	1.1	Autonomous packaging systems using Artificial Intelligence and Industry 5.0	5	["1"]
	1.2	Digital twins and cyber-physical systems for intelligent packaging	5	["1"]
	1.3	Intelligent decision support systems for predictive packaging management.	5	["2"]
2	Advanced Packaging Engineering and Process Optimization			
	2.1	Bio-inspired, programmable, and multifunctional packaging materials.	5	["3"]
	2.2	Circular bioeconomy and net-zero carbon packaging technologies.	5	["3"]
	2.3	Advanced life cycle assessment (LCA), environmental impact assessment, and eco-design.	5	["3"]
3	Digital Food Quality Control and Analytical Technologies			
	3.1	Multi-omics approaches (genomics, proteomics, metabolomics) for food quality assessment.	5	["4"]
	3.2	Digital Product Passport (DPP), blockchain-enabled traceability, and food authenticity verification.	5	["4"]
	3.3	Precision food quality engineering, predictive maintenance, and autonomous manufacturing systems.	5	["4"]

Module	Units	Course Description	Hrs	CO No.
4		Global Food Safety Systems and Sustainable Innovations		
	4.1	Advanced packaging validation, accelerated shelf-life studies, and packaging performance modeling.	5	["5"]
	4.2	Technology commercialization, intellectual property rights (IPR), and innovation management in the food industry.	5	["5"]
	4.3	Future food systems: cultured foods, precision fermentation, personalized nutrition, and next-generation packaging innovations.	5	["5"]

Teaching and Learning Approach	Classroom Procedure (Mode of transaction)
	Module 1&2 – Lecturing , ICT Enabled Learning Module 3 & 4- Lecturing, ICT Enabled Learning

Assessment Types	MODE OF ASSESSMENT Mode of Assessment: Theory
	A. Continuous Comprehensive Assessment (CCA) • Theory – 30 Marks □ Assignments □ Class tests □ Seminars
	B. End Semester Evaluation (ESE) • Theory – 70 Marks Assessment Methods – Duration of Examination 2 hours Pattern of examination for Theory Different parts of written examination {Part – A, B, C Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ◦ PART - A ◦ Short answer - (10 out of 12) – 10 × 2 = 20 ◦ PART - B ◦ Short Essays/Problems - (6 out of 8) – 6 × 5 = 30 ◦ PART - C ◦ Essays - (2 out of 4) – 2 × 10 = 20

References

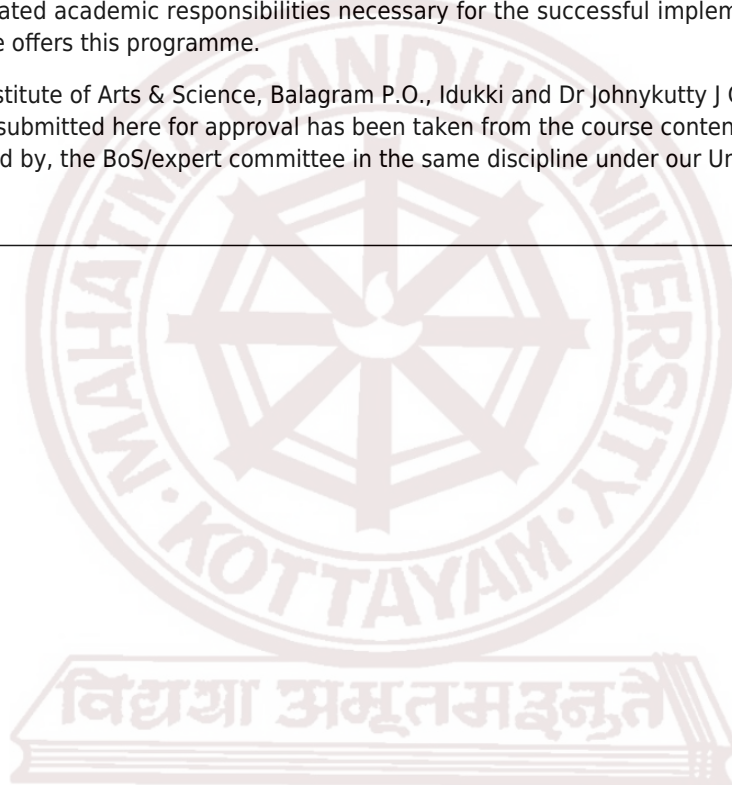
- 1.Nielsen, S. S. (2017) Food Analysis, 5th Edition, Springer, New York. 2.Skoog, D. A., Holler, F. J. and Crouch, S. R. (2018) Principles of Instrumental Analysis, 7th Edition, Cengage Learning. 3.AOAC (2019) Official Methods of Analysis, 21st Edition, Association of Official Analytical Chemists, Washington DC. 4.Jay, J. M., Loessner, M. J. and Golden, D. A. (2005) Modern Food Microbiology, 7th Edition, Springer, New York. 5.FSSAI (2016) Manual of Methods of Analysis of Foods, Food Safety and Standards Authority of India, New Delhi. 6. Gordon L. Robertson. 2014. Food Packaging: Principles and Practice, 3rd Ed. CRC Press, Boca Raton FL, USA. 7.Robertson, (1998), Principles of Food Packaging Press, USA 8.Scharow, S., and Griffin, R.C. (1980). Principles of Food Packaging, 2nd Edition, AVI Publications Co. Westport, Connecticut, USA. 9.Rajia Ahvenainen. 2003. Novel Food Packaging Techniques. CRC-Woodhead Publishing Ltd., Cambridge, England. 10.Richard Coles, Berek McDowell and Mark J. Kirwan. 2003. Food Packaging Technology. Blackwell Publishing Ltd., Oxford, UK

Suggested Readings

- 1.Pomeranz, Y. and Meloan, C. E. (2000) Food Analysis: Theory and Practice, Springer, New York. 2.Fellows, P. (2017) Food Processing Technology: Principles and Practice, 4th Edition, Woodhead Publishing. 3.Ranganna, S. (2009) Handbook of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill, New Delhi. 4.Lawless, H. T. and Heymann, H. (2010) Sensory Evaluation of Food: Principles and Practices, Springer, New York. 5.Gordon L. Robertson. 2010. Food Packaging and Shelf Life – A Practical Guide. CRC Press, Boca 6. Dong Sun Lee. 2008. Food Packaging Science & Technology.

Affidavit

- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki and Dr Johnykutty J Ozhukayil, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki, agree to appoint a new course coordinator for the proposed Food Packaging Technology & Quality Control Test Methodologies in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, Jawaharlal Nehru Institute of Arts & Science, Balagram P.O., Idukki and Dr Johnykutty J Ozhukayil, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.



MGU-UGP (HONOURS)

Syllabus