



CVM
UNIVERSITY

Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: Master of Technology (Food Technology)

Semester: 2

Course Code: 202380210

Course Title: Advances in Food Packaging Technology

Course Group: Program Elective IV

Course Objectives:

1. To provide knowledge about selected trends and development in food packaging technologies and materials aiming at assuring the safety and quality of foodstuffs in order to design an optimized package which satisfies all legislative, marketing and functional requirements sufficiently, and fulfils environmental, cost and consumer demands as well as possible.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	0	2	4	50/20	50/20	25/10	25/10	150/60

* J: Jury; V: Viva; P: Practical

Detailed Syllabus

Sr.	Contents	Hours
1	Introduction Functions of packaging and classification of packaging materials; Packaging requirements and selection of packaging materials; Design considerations of food packaging	4



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2	Properties, advantages, limitations and applications of packaging materials Glass: composition, properties, types of closures, methods of bottle making; Metals: Tinplate containers, tinning process, components of tinplate, tin free steel (TFS), types of cans, aluminum containers, lacquers; Plastics: types of plastic films, laminated plastic materials, co-extrusion, Tensile strength, bursting strength, tearing resistance, puncture resistance, impact strength, tear strength; Barrier properties of packaging materials; Theory of permeability, factors affecting permeability, permeability coefficient, gas transmission rate (GTR) and water vapour transmission rate (WVTR) and its significance	10
3	Biodegradable Packaging Materials: Edible films and Coatings; Recent advances in the biodegradable plastics; Paper: pulping, fibrillation and beating, types of papers and their testing methods, Corrugated Fiber Board	5
4	Recent trends in food packaging systems Definition; Active packaging systems; intelligent packaging systems: Quality Indicators, Time-temperature indicators, gas concentration indicators, RFID; Self heating and cooling packages; Nanotechnologies in food packaging; Oxygen and ethylene scavenging technology: Concept and its food applications; Antimicrobial food packaging: concept and mechanism, Factors affecting the effectiveness of antimicrobial packaging; Modified and controlled atmospheric packaging	7
5	Packaging-flavor interactions Factors affecting flavour absorption, Role of the food matrix and different packaging materials. Case studies: Packaging and lipid oxidation, Modelling lipid oxidation and absorption Shelf life evaluation of packaged food	5
6	Shelf life of packaged food Hygroscopic food , fat rich foods, crispy snacks foods, minimally processed foods	3
7	Safety and legislative aspect of packaging and labelling Introduction: package selection criteria; Migration; Regulatory considerations; Safety considerations for plastic packaging, metal packaging, glass packaging and paper packaging, food labelling	5

List of Practicals / Tutorials:

1	Determination of WVTR in different packaging materials
2	Determination of GTR in different packaging materials
3	Anti-microbial packaging for fruits and vegetables
4	Bursting strength of packaging materials
5	Tensile strength of packaging materials
6	Accelerated shelf life testing of packaged foods
7	Determination of oil and grease resistant test for packaging films
8	Determination of tear strength of packaging materials



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9	Grading of glass bottles for alkalinity
10	Identification of plastic packaging materials

Reference Books:

1	Ahvenainen R. 2001. Novel Food Packaging Techniques. CRC.
2	Crosby NT. 1981. Food Packaging Materials. App. Sci. Publ
3	Mahadeviah M & Gowramma RV. 1996. Food Packaging Materials. Tata McGraw Hill.
4	Painy FA. 1992. A Handbook of Food Packaging. Blackie
5	Palling SJ. 1980. Developments in Food Packaging. App. Sci. Publ.
6	Rooney ML. 1988. Active Food Packaging. Chapman & Hall.
7	Sacharow S & Griffin RC.1980. Principles of Food Packaging. AVI Publ

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Industrial/ Field visits
- Course Projects

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						R: Remembering; U: Understanding; A: Application, N: Analyze; E: Evaluate; C: Create
R	U	A	N	E	C	
25	30	15	15	10	05	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.



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Course Outcomes (CO):

CO-1	Selection of packaging material for food and its machine suiting to process line	35
CO-2	Relate the properties of food packages to conversion technologies, processing and packaging technologies and user requirements including safety, convenience and environmental issues	30
CO-3	Understand Safety and legislative aspect of packaging	35

Curriculum Revision:	
Version:	2.0
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025