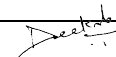


**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	<b>Year: 1</b>	<b>Semester 1</b>
<b>Name of Faculty:</b> Mrs. MehrukhIffat      Unit I, II, III, IV Mrs. Swati Sharma      Unit V, VI, VII, VIII		
<b>Paper-1 Subject: Food Science</b>		
<b>Course Code: B058101T</b>	<b>Course Title: Basic Nutrition &amp; Sanitation &amp; Hygiene</b>	
<b>Course outcomes:</b> Students will gain an understanding of: <ul style="list-style-type: none"> <li>• understand the concepts of basic nutrition , how to use food guide , pyramid , optimum nutrition , mal nutrition , sign of good health , metabolism of carbohydrate , protein &amp; fats .</li> <li>• recognize Food borne illness , control of pest , solid &amp; liquid waste disposal</li> <li>• be aware of Cleaning procedure in catering, structure &amp; layout of food remises maintaining clean environment.</li> <li>• Exhibit potential to manage the quality and safety, storage of food.</li> </ul>		
<b>Credits: -</b>	<b>Elective-</b>	
Max.Marks: 25+75	Min.PassingMarks- As per rule	
TotalNo.ofLectures= 60		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>
<b>I</b>	Historical developments in Food Science and Technology-Indian perspective <b>Introduction to nutrition</b> -Food as a source of nutrients, Function of foods, Definition of nutrition, Nutrients, Adequate optimum and good nutrition, Malnutrition. Inter-relationship between nutrition and health, Visible symptoms of good health.	<b>10</b>
<b>II</b>	<b>Food guide:-</b> Basic five food groups -how to use food guide Use of food in body – digestion, absorption, transport, utilization of nutrients in body. Water as a nutrients, function, sources, requirement, water balance-effect of deficiency	<b>10</b>

  
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<b>III</b>	<b>Energy:-</b> Unit of energy, Food as a source of energy, Energy value of food, The body's need for energy, B.M.R activity for utilization of food to fat energy requirement. Acid-base balance.	<b>5</b>
<b>IV</b>	<b>Minerals&amp; Vitamins:-</b> – Function, Sources, Bio availability and deficiency of following minerals - Calcium, Iron, Iodine, Fluorine, Sodium, Potassium <b>Vitamins</b> - Classification, Units of measurement, Sources, Function, Deficiency about water and fat soluble vitamins.	<b>5</b>
<b>V</b>	<b>Food contamination</b> – Sources and transmissions water, air, sewage and soil as reservoir of infection and type of spread. Importance of personal Hygiene of Food handler – Habits – clothes, illness Education of food handler in handling and serving food.	<b>10</b>
<b>VI</b>	Safety in food procurement, storage, handling and preparation control of spoilage – safety of left over foods. Cleaning Methods – Sterilization and disinfection – products and methods – use of detergents, heat, chemicals, test for sanitizer strength.	<b>10</b>
<b>VII</b>	<b>Sanitation</b> – Kitchen design equipment and systems. Structure and layout of food premises maintaining clean environment. Selecting and installing equipment cleaning equipment. Waste product handling – Planning for waste disposal, Solid wastes and liquid wastes.	<b>05</b>
<b>VIII</b>	<b>Control of Infestation</b> – Rodent control Rats, Mice- Rodent, destruction. Vector control – Use of pesticides. Food Sanitation, Control and Inspection – planning and Implementation of training programmes for health personal.	<b>05</b>

### Recommended Books/references:

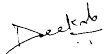
1. S. Roday 2005 Food Hygiene and Sanitation in Food Industry 7<sup>th</sup> Edition Published by Tata McGraw Hill Publishing Company New Delhi .
2. Shubhangini A. Joshi. 2015 Nutrition and Dietetics 4<sup>th</sup> Edition Published by McGraw Hill Education (India) Private Limited..

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**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

  
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	<p><b>Enzymes:</b> Nomenclature, definite, specificity, catalysis regulations enzyme, kinetics, Factors influencing enzyme, activity, controlling enzyme action.</p> <p>Enzyme. Added to food. During processing Modification of food. By endogenous enzyme. Enzyme inhibitors in foods.</p>	
<b>IV</b>	<p>General courses for loss in foods. Fortification, enrichment, restorations.</p> <p>its indigenous to food, structure, chemical and physical properties, affect processing and storage.</p> <p>Flavours- Veg. fruit and spice flavours, from Ferments Meal and sea foods.</p>	<b>10</b>
<b>V</b>	<p><b>Cereals &amp; pulses:-</b>Cereals and millets - breakfast cereals, cereal products , fast food, structure, processing, using variety of preparation, selection, variety storage, nutrition aspects and cost. Pulses and legumes -production (in brief) selection and variety, storage, processing, using variety of preparation, nutrition aspects and cost.</p> <p><b>Milk and Milk Products:-</b>Composition, classification, quality, processing, storage, uses, cost, nutritional aspects of milk. curds, buttermilk, paneerkhoa, cheese ice cream, kulfi and various kind of processed milk.</p> <p><b>Eggs:-</b>Production, grade, quality, selection, storage ,uses, cost and nutritional aspects.</p>	<b>5</b>
<b>VI</b>	<p><b>Fish, Poultry and Meat:-</b>Selection, purchase, storage, uses, cost and nutritional aspects , <u>Blue Foods.</u></p> <p><b>Vegetable and Fruits:-</b>Variety, selection, purchase, storage, availability, cost, uses and nutritional aspects of raw and processed vegetable and fruits.</p> <p><b>Sugar and Sugar Products:-</b>Different forms of sugar (sugar, jaggery, honey syrup) manufacture, selection, storage and use preserves</p>	<b>10</b>
<b>VII</b>	<p><b>Fats and Oils:-</b>Types and source of fats and oils (animal and vegetable) processing, uses, storage, cost and nutritional aspects.</p> <p><b>Raising agent:-</b>Types, constituents, uses in cookery and bakery, preservation methods.</p> <p><b>Food Adjuncts:-</b>Spices, condiments, herbs, extracts, concentrates, essences, food colors, origin, classification, description ,uses, specification, procurement and storage.</p>	<b>05</b>

<b>VIII</b>	Salt- Types, uses in the diet.  Tea, coffee, chocolate, and cocoa powder  Growth, cultivation, processing, cost and nutritional aspects.	<b>05</b>
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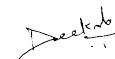
**Recommended Books/references:**

1. Food Facts & Principles by ShakuntalaManay.

**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

  
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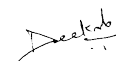


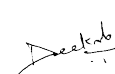
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**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	<b>Year: 2nd</b>	<b>Annual</b>
<b>Name of Faculty: Mrs. Mehrukh Iffat</b>		
<b>Paper-Subject: Food Science</b>		
<b>Course Code: B 258</b>	<b>Course Title: Food Packaging &amp; Post harvest Technology.</b>	
<b>Course outcomes:-</b> The students at completion will be able to know about :- Food Packaging Laws, Packaging Methods, Packaging & shelf life testing. , processing technology of food product like milk & milk product , cereal & cereal product.		
<b>Credits: -</b>	<b>Elective-</b>	
<b>Max.Marks: 50</b>	<b>Min.Passing Marks- As per rule</b>	
<b>Total No. of Lectures= 60</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>

<b>I</b>	Evaluation of Food Packaging.	
<b>II</b>	Importance of Packaging .	
<b>III</b>	Packaging Criteria, Appearance, Protection, Function, Cost, Material and Forms of Packaging.	
<b>IV</b>	Packaging methods & Performances.	

  
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	Packaging Specification & Control of Packaging Quality	
<b>IV</b>	<p>Consideration for Testing Sensory Evaluation</p> <ol style="list-style-type: none"> <li>i. Testing Area</li> <li>ii. Testing Setup</li> <li>iii. Lighting</li> <li>iv. Testing Schedule</li> <li>v. Preparation of Sample</li> <li>vi. Cooling &amp; Order of Presentation</li> <li>vii. Choosing &amp; Training of Panelist</li> </ol>	
<b>V</b>	Types of Panelist – Trained & Untrained Panelist	
<b>VI</b>	Data Analysis	
<b>VII</b>	Spectrophotometry- Phosphorus & Ascorbic Acid.	
<b>VIII</b>	<p>Radioactive Tracer Techniques, Radioactive Counter Gas and Liquid Scintillation.</p> <div style="text-align: right;">   <b>Dr. Deeksha Yajurvedi</b>  Coordinator  Department of Food Sc.&amp; Q.C.  Raghnath Girls' Post Graduate  College, Meerut </div>	

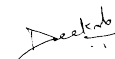
<b>IX</b>	Fluorimetry- Thiamin& Riboflavin	
<b>X</b>	Principles and Techniques of Separation Methods- Chromatography (TLC, GLC,HPLC). Electrophoresis-Paper, Moving boundary, Agar, b-Carotene.	
<b>XI</b>	Atomic Absorption- Iron, Calcium/ Any Trace element.	
<b>XII</b>	Measurement of Enzyme Activity- Principles of any enzyme to be estimated	

**Recommended Books/references:**

**Food microbiology by William H. Frazier,  
Food Facts & Principles by ShakuntalaManay.**

**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

  
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**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	<b>Year: 2nd</b>	<b>Annual</b>
<b>Name of Faculty: Mrs. Swati Sharma</b>		
<b>Paper-1 Subject: Food Science</b>		
<b>Course Code: B 256</b>	<b>Course Title: Food Preservation</b>	
<b>Course outcomes:-</b>		
The students at completion will be able to know about :- principle of food preservation , preservation by use of high temperature ,preservation by use of low temperature , preservation of different food by using different method. contamination& spoilage of different food products by different type of micro organism.		
<b>Credits: -</b>	<b>Elective-</b>	
<b>Max.Marks: 50</b>	<b>Min.Passing Marks- As per rule</b>	
<b>Total No.of Lectures= 60</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>

<b>I</b>	Principles of Food Preservation, Methods of Food Preservation, Asepsis, Removal of Microorganisms, Maintenance of Anaerobic Conditions.	
<b>II</b>	<b>Preservation by Use of High Temperature</b> – Factors affecting Heat Resistance, Heat Resistance of Microorganisms and their Spores. Determination of Heat Resistance, TDT Curves (Thermal Death Time Curves), 12D concept, Heat Preservation, Determination of Thermal Processing, Heat Treatments employed in Processing Foods, Canning.	
<b>III</b>	<b>Preservation by Low Temperatures</b> – Growth of Microorganisms at Low Temperatures, Preparation of Food for Freezing, Temperature employed in Low Temperature Storage, Freezing of Food & Freezing Effects, Effect of Subfreezing and Freezing Temperatures on Microorganisms.	

  
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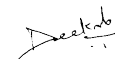
	<ul style="list-style-type: none"> <li>• Vegetables, Asparagus, Beans, Beetroots, Cabbage, Carrot, Cauliflower, Gram, Mushroom, Okra (Lady Finger), Peas, Potato, Tomato, Turnip, Tomato Product etc.</li> </ul> <p>iv. Preservation of Meat &amp; Meat Products</p> <p>v. Fish and Other Sea Foods</p> <p>vi. Eggs and Poultry</p> <p>vii. Milk and Milk Products</p> <p>viii. Miscellaneous foods- example: Fatty Foods, Essential Oils, Bottled Beverages etc.</p>	
<b>VIII</b>	<p>Preservation by Carbonation, Filtration &amp; Improved Equipment</p> <p>for manufacture of Preserves, Some important Preserves e.g.:</p> <p>Aamla, Apples, Bael, Ber (Indian Jujube), Carrot, Cherry, Candied Citrus Peels, Ginger Candy, Karounda, Mango, Pear, Petha (Pumpkin), Pineapple, Strawberry.</p>	

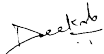
**Recommended Books/references:**

1. Food microbiology by William H. Frazier

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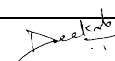


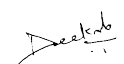
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**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	<b>Year: 2nd</b>	<b>Annual</b>
<b>Name of Faculty:</b> Mrs. Mehrukh Iffat Section A – 1, 2, 3, 4, 5, 6 Mrs Swati Sharma Section B - 1, 2, 3, 4, 5, 6		
<b>Paper-Subject: Food Science</b>		
<b>Course Code: B 257</b>	<b>Course Title: SENSORY EVALUATION AND ANALYTICAL INSTRUMENTATION</b>	
<b>Course outcomes:-</b> The students at completion will be able to know about :- factors affecting food acceptance , sensory assessment of food quality, type of panelist , sensory testing of food.		
<b>Credits: -</b>	<b>Elective-</b>	
Max.Marks: 50	Min.Passing Marks- As per rule	
Total No. of Lectures= 60		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>

<b>I</b>	Factors affecting Food Acceptance-Sensory. Psychosocial and Physiological.	
<b>II</b>	<p>Sensory Assessment of Food Quality:-</p> <ul style="list-style-type: none"> <li>i. Appearance of Food - Visual perception, Color of Foods</li> <li>ii. Odour &amp; Smell</li> <li>i. Flavor</li> <li>iv. Texture</li> <li>V. Taste</li> </ul>	

  
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<p><b>III</b></p>	<p>Sensory Testing of Foods:-</p> <ul style="list-style-type: none"> <li>i. Threshold Test</li> <li>ii. Difference Test</li> <li>iii. Ranking Test</li> <li>iv. Scoring Test</li> <li>v. Hedonic Test</li> <li>vi. Acceptance and Preference Test</li> </ul>	
<p><b>IV</b></p>	<p>Consideration for Testing Sensory Evaluation</p> <ul style="list-style-type: none"> <li>i. Testing Area</li> <li>ii. Testing Setup</li> <li>iii. Lighting</li> <li>iv. Testing Schedule</li> <li>v. Preparation of Sample</li> <li>vi. Cooling &amp; Order of Presentation</li> <li>vii. Choosing &amp; Training of Panelist</li> </ul>	
<p><b>V</b></p>	<p>Types of Panelist – Trained &amp; Untrained Panelist</p>	
<p><b>VI</b></p>	<p>Data Analysis</p>	
<p><b>VII</b></p>	<p>Spectrophotometry- Phosphorus &amp; Ascorbic Acid.</p>	 <p>Dr. Deeksha Yajurvedi Coordinator Department of Food Sc.&amp; Q.C. Raghunath Girls' Post Graduate College, Meerut</p>

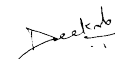
VIII	Radioactive Tracer Techniques, Radioactive Counter Gas and Liquid Scintillation.	
IX	Fluorimetry- Thiamin& Riboflavin	
X	Principles and Techniques of Separation Methods- Chromatography (TLC, GLC,HPLC). Electrophoresis-Paper, Moving boundary, Agar, b-Carotene.	
XI	Atomic Absorption- Iron, Calcium/ Any Trace element.	
XII	Measurement of Enzyme Activity- Principles of any enzyme to be estimated	

**Recommended Books/references:**

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**Food Facts & Principles by ShakuntalaManay.**

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**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	Year:3rd	<b>Annual</b>
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<b>Name of Faculty:</b> Mrs. Swati Sharma		
<b>Paper-Subject:Food Science</b>		

<b>CourseCode:B 356</b>	<b>CourseTitle:FOOD ANALYSIS.</b>
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<p><b>Courseoutcomes:-</b></p> <p>The students at completion will be able to know about :-</p> <p>Food composition and factors affecting food composition, General physical methods</p> <p>i Refractometry, Lactometric determination.</p> <p>ii Polarimetry and Polarography</p> <p>iii. Food Rheology</p> <p>iv. Viscosity</p> <p>v. Surface Tension</p> <ul style="list-style-type: none"> <li>• Total Protein Nitrogen, Non Protein Nitrogen and Specific Protein in foods. Crude Fibre and Dietary Fibre, Total Carbohydrate, Starch, Gums, Monosaccharide &amp; Disaccharide.</li> </ul>
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<b>Credits:</b>	Elective-
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Max.Marks: 50	Min.PassingMarks- As per rule
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TotalNo.ofLectures= 60	
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<b>Unit</b>	<b>Topics</b>	<b>No. ofLectures</b>
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<b>I</b>	Food composition and factors affecting food composition.	
<b>II</b>	Sampling Techniques.	
<b>III</b>	Preparation of samples.	

  
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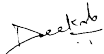
<b>IV</b>	<p>General physical methods of food analysis:</p> <ul style="list-style-type: none"> <li>i. Lactometric determination</li> <li>ii. Refractometry</li> <li>i. Polarimetry and Polarography</li> <li>iv. Food Rheology</li> <li>v. Viscosity</li> <li>vi. Surface Tension</li> <li>vii. Freezing Point</li> </ul>	
<b>V</b>	<p>General chemical methods of food analysis:</p> <ul style="list-style-type: none"> <li>i. Proximate principles <ul style="list-style-type: none"> <li>a) Moisture</li> <li>b) Specific Gravity</li> <li>c) Ash and types</li> </ul> </li> </ul>	
<b>VI</b>	Total Protein N, Non Protein N and Specific Protein in foods.	
<b>VII</b>	Total Fat and different types of Lipids.	
<b>VIII</b>	Total Carbohydrate, Starch, Gums, Monosaccharide & Disaccharide.	
<b>IX</b>	Crude Fibre and Dietary Fibre.	
<b>X</b>	<p>Macro Nutrients&amp;</p> <ul style="list-style-type: none"> <li>i Sodium, Potassium, Phosphorus, Calcium, Magnesium, Iron, Zinc</li> <li>ii. Vitamins</li> <li>iii Trace Elements</li> </ul>	

**Recommended Books/references:**

1. Food microbiology by William H. Frazier,
2. Food Facts & Principles by Shakuntala Manay.

**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

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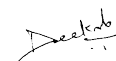


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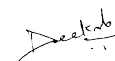
**Department of Food Science & Quality Control**

<b>Programme: B.Sc</b>	<b>Year: 3rd</b>	<b>Annual</b>
<b>Name of Faculty:</b> Mrs. MehrukhIffat		
<b>Paper-Subject:Food Science</b>		
<b>CourseCode:B 357</b>	<b>CourseTitle:FOOD MANUFACTURING</b>	
<b>Courseoutcomes:-</b>		
<ul style="list-style-type: none"> <li>To develop new food products which are marketable and nutritionally andeconomically viable.</li> <li>To develop entrepreneurial abilities for small scale industry.</li> </ul>		
<b>Credits: -</b>	<b>Elective-</b>	
<b>Max.Marks: 50</b>	<b>Min.PassingMarks- As per rule</b>	
<b>TotalNo.ofLectures= 60</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. ofLectur es</b>

<b>1</b>	Market and Consumer Research. Needs and types of food consumption and trends.Economic, Physiological, Anthropological and Sociological Dimensions of food Consumption pattern.	
<b>2</b>	Trends in social change and its role in diet pattern. Using social trends as a framework in new product innovation	
<b>3</b>	Food situation in India and outside. Tapping the unconventional post-harvest losses and prospects for food processing for export.	

  
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4	Traditional foods-Status and need for revival in the context of determined non-traditional foods, urbanization and such factors.	
5	Product development: Primary Processing, Secondary Processing. Types of products e.g. Quick cooking, Fast foods, fabricated foods and Convenience foods	
6	Additives, Preservatives, Processing, Formulation, Standardization and Large Scale Preparation	
7	Chemical and Physical properties of food, Shelf life studies and shelf life prediction, Sanitization and waste disposal.	
8	Packaging- Packaging suitability and functions, Development and management, Design and package graphics, Labelling, Research and Testing.	
9	Transportation, Types/Modes, Optimization of Transportation taking into account, Type of product, Distance, Storage facilities etc	
10	Sensory evaluation and Product Testing/Quality Control, Objective and Subjective Testing.	
11	Entrepreneurship, Plant Location, Investment, Financing of Project.	
12	Food Laws Equipment and Space.	

  
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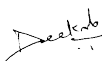
13	Costing of product.	
14	Advertising and Marketing.	
15	Project work to be submitted at the end of the course.	

**Recommended Books/references:**

1. ShakuntlaManay – Food Facts & Principles.
2. Norman Potter – food Science.

**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

  
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**Department of Food Science & Quality Control**

<b>Programme: B.Sc.</b>	Year: 3rd	<b>Annual</b>
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**Name of Faculty:** Mrs. MehrukhIffat - FOOD TOXICOLOGY 1, 2, 3, 4, 5, 6, 7, 8.  
 Mrs. Swati Sharma - FOOD ADULTERATION AND TESTING 9, 10, 11, 12, 13.

**Paper-Subject:Food Science**

<b>CourseCode:B 358</b>	<b>CourseTitle:FOOD TOXICOLOGY AND FOOD ADULTERATION AND TESTING</b>
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**Courseoutcomes:-**  
 Student would be able to -

- The students at completion will be able to know about :- Genetically engineered food ,pests and their safety. Carcinogens
- Importance of Toxicology. Physical treatment of food and health hazards Substances intentionally added to foods. Choice of technology, plant and equipment. Creativity and innovation. Food Laws, Food adulteration, Composition & quality of food products.

<b>Credits: -</b>	Elective-
Max.Marks: 50	Min.PassingMarks- As per rule

TotalNo.ofLectures= 60

<b>Unit</b>	<b>Topics</b>	<b>No. ofLecture s</b>
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<b>1</b>	Importance of Toxicology.	
<b>2</b>	Naturally occurring toxins in various foods.	
<b>3</b>	Residual chemicals utilized in food production and processing:- i. Chemical preservation. ii. Pesticides iii. Heavy metals, Hormones in food.	

  
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4	Substances intentionally added to foods. (Food Additives)i. Antioxidantsii. Coloriii.Stabilizers & Heavy Metal	
5	Microbial and Parasitic: i. Food poisoning and food infections or food borne illness. ii. Mycotoxins- a flatoxin iii. Bacterial toxin	
6	Physical treatment of food and health hazards: Irradiation - heat treatment	
7	Carcinogens	
8	Genetically engineered food pests and their safety.	
9	Food laws: Voluntary Mandatory- National and International	
10	Role of Voluntary Agencies and Legal aspects of Consumer Protection	
11	Food Standard	
12	Food Adulteration	
13	Composition and Quality criteria for the following: i. Milk and Milk Products ii. Oil and Fats iii. Spices and Condiments	

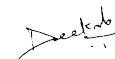
  
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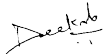
iv. Food grains	
v. Flours	
vi. Canned foods	
vii. Fruits and Vegetable products	
viii. Flesh food	
ix. Sugar and Preserves	
x. Beverages- Alcoholic and Non Alcoholic	

**Recommended Books/references:**

1. Food Toxicology by Hugo de Vries ,
1. Food Sanitation & Hygiene by S.Roday

**Suggested Continuous Evaluation Methods:** Students can be evaluated on the basis of score obtained in a mid-term exam, together with the performance of other activities which can include short exams, in-class or on-line tests, home assignments, group discussions or oral presentations, among others .

  
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