

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Home and Health Sciences)

Course: Food Biotechnology (7508)
Level: M. Sc.

Semester: Autumn, 2013
Credit Hours: 4(3+1)

LIST OF CONTENT

This package comprises the following materials:

1. Course Book (Unit 1-9)
2. Theory Assignments One
3. Practical Assignment One
4. Assignments forms (06)
5. Schedule for submitting the assignments and tutorials meetings.

Note: - If you find any thing missing from the above mentioned material, kindly inform:

The Mailing Officer

Mailing Section

Services & Operational Unit

AIOU, H-8, Islamabad

Phone: 051-9057611-12

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WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

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Total Marks: 100
Pass Marks: 40

ASSIGNMENT No. 1
(Units: 1 to 7)

Note: Write answers to the following questions.

- Q. 1 Write notes on the following: **(20)**
- i) Kiln driers
 - ii) Asepsis & Softening
 - iii) Difference between cabinet, tunnel and spray dryers
 - iv) Difference between d, z, f value
- Q. 2 Discuss the genera of bacteria important in food bacteriology. **(10)**
- Q. 3 Write down the detailed role of different spoilage agents in deterioration of vegetables. **(10)**
- Q. 4 What are different kinds of spoilage dominant in canned foods? Discuss each in detail. **(10)**
- Q. 5 Enlighten the chemical changes occur in butter and cheese during their spoilage. **(10)**
- Q. 6 Discuss the mechanism of action of Nitrite & Nitrates; and benzoic acid in preservation of food. **(10)**
- Q. 7 Write notes on the following: **(20)**
- i) Summarize the spoilage of fresh liver
 - ii) Perigo Factor

- iii) Natamycin and tetracycline's
 - iv) Thermal Death time
- Q. 8 Discuss the different ways in which heat management can be used for preservation of fruits and vegetables. (10)

ASSIGNMENT No. 2

Total Marks: 100
Pass Marks: 40

A workshop is compulsory for all the students. Marks obtained during the workshop will be included in your final result. This assignment is practical in nature and all the students will visit a local food industry under supervision of resource person to carry out the following activity.

Visit a local industry of your area and prepare a report (20-25 pages) covering industrial food processing steps starting from receipt of raw material till production of end product.

COURSE OUTLINE

FOOD BIOTECHNOLOGY (7508)

Level: M.Sc.

Credit Hours: 3(2+1)

Unit-1: FOOD AS A SUBSTRATE FOR MICROORGANISMS

- Factors Affecting Microbial Growth (PH, Moisture Content, Nutrients etc.)
- Morphological and Physiological Characteristics Important in Food Bacteriology.
- Groups of Bacteria Important in Food Bacteriology.

Unit-2: SPOILAGE OF FRUITS AND VEGETABLES

- Microbial Spoilage of Fruits and Vegetables
- Spoilage of Fresh and Processed Meat, Poultry and Sea Foods
- Detection and Mechanism of Meat, Poultry and Sea Food Spoilage

Unit-3: SPOILAGE OF MISCELLANEOUS FOODS

- Microbiology of Eggs, Cereals, Flour, and Dough Products, Bakery Products, Dairy Products. Sugars, Candies, and Spices and Fermented Foods, Mayonnaise and Salad Dressings, Canned Foods.

Unit-4: CHEMISTRY OF FOOD SPOILAGE

- Magnitude of Problem, Dairy Products. Egg Products, Fruits and Vegetables, Meat Products

Unit-5: PRESERVATION OF FOOD

- Properties of Different Food Preservatives
- Mode of Action and Effect of Different Preservatives
- Anti-Fungal Agents for Fruits and Vegetables
- Miscellaneous Chemical Preservatives with low Temperature
- Freezing for Preservation - Effects of Thawing
- Drying with Different Temperatures
- Microbiology of Intermediate Moisture Foods

Unit-6: CONTAMINATION, PRESERVATION AND SPOILAGE OF VEGETABLES AND FRUITS

- Contamination and Preservation of Vegetables,
- Asepsis, Removal of Micro-Organisms,(Use of Heat, Use of Low Temperature, Chilling, Freezing, Drying, Use of Preservatives, Preservation by Irradiation, Preservation of Fruits and Fruit Products)
- General Types of Microbial Spoilage. Spoilage of Fruit and Vegetable Juices.

UNIT 7: FOOD DEHYDRATION: DRYING METHODS AND DRIERS

- Introduction to Food Dehydration
- Selection of Drying Method.
- Types of Dryers (Hot Air Dynamics, Heat Supply, Instrumentation for Food Dehydration, Cabinet Driers, Kiln Driers, Conveying Driers, Tunnel Driers, Belt-Trough Driers, Continuous Conveyor Driers, Bin Driers, Spray Driers, Pan Driers, Drum Driers.)

UNIT 8: DYNAMICS OF FOOD PACKAGING TECHNOLOGY

- Introduction to Dynamics of Food Packaging Technology.
- Sanitary Cans, Glass Containers, Paper Containers
- Requirements of a Container, Basic Factors. Consumer Acceptance Factors, Rating the Container Weighted Values of Factors.
- The age of Protective Packaging. Water Vapour Transmission, Bursting Strength, Tensile Strength and Elongation Internal Tearing Resistance, Grease Resistance, Gas Permeability.

UNIT 9: MICROBIOLOGY IN FOOD SANITATION

- Bacteriology of Water Supplies.
- Sewage and Waste Treatment and Disposal
- Microbiology of the Food Product, Good Manufacturing Practices.
- Hazard Analysis: Critical Control Points (HACCP), Health of Employees.

Recommended Books:

1. SN Tripathy. 2004, Food Biotechnology Dominant Publishers and Distributors
2. Food Microbiology. C-Code 868. AIOU Compiled Material