مفردات المادة العلمية لقسم التقانات الاحيائية وعلوم الأغذية

المرحلة الأولى – الفصل الأول

1-تقنيات مكننة انتاج زراعي

Delivery Plan (Weekly Syllabus)	
Week	**Material Covered**
Week 1	**Agricultural buildings used for animal production and how to construct them**
Week 2	**Controlling environmental conditions inside animal pens**
Week 3	**Providing water to animal pens for daily consumption and storage**
Week 4	**Pumps used in animal production, their types and sizes, and choosing the best one for the project**
Week 5	**Agricultural buildings used for production and how they are constructed.**
Week 6	**Controlling environmental conditions inside animal pens.**
Week 7	**Mechanisation of animal feed production and storage.**
Week 8	**Technological methods for crushing animal feed**
Week 9	**Mechanisms for harvesting and collecting feed in the field**
Week 10	**Equipment for preparing soil for cultivation**
Week 11	**Sowing and planting techniques**
Week 12	**Fertilisation and spraying machines**
Week 13	**Field crop harvesting machines**
Week 14	**Automatic milking equipment and systems**
Week 15	**Types of maintenance and storage of machinery**

Delivery Plan (weekly practical)	
week	**Material Covered**
Week 1	**Conditions that must be followed when designing agricultural buildings**
Week 2	**Mechanism to control temperature, humidity, and ventilation for barns**
Week 3	**Available and suitable water sources for farms**
Week 4	**Pump maintenance, cleaning and installation**
Week 5	**Conditions to be considered when designing agricultural buildings**
Week 6	**Temperature, humidity and ventilation control mechanisms for barns**

Week 7	**Maintenance and adjustment of feed baling equipment**
Week 8	**Feed mills and mixers and how they work**
Week 9	**Transport vehicles, their types, and how to connect them to agricultural tractors**
Week 10	**Ploughing and types of ploughs**
Week 11	**Understanding types of seeders and calibration methods**
Week 12	**Knowing methods of fertiliser distribution and spraying**
Week 13	**Distinguishing between harvesters and their types**
Week 14	**Learning preventive maintenance steps**
Week 15	**Safety guidelines when using agricultural equipment**

2-مبادئ علم الاحياء المجهرية

Delivery Plan (Weekly Syllabus)	
Week	**Material Covered**
Week 1	**Introduction to microbiology, its history, and its importance in food science.**
Week 2	**Classification of microorganisms and their most important types that affect food.**
Week 3	**Prokaryotic and Eukaryotic Cells - Differences and Structures.**
Week 4	**Structure and functions of the parts of the microbial cell (wall, membrane, flagella...).**
Week 5	**Fungi, viruses, and protists associated with food.**
Week 6	**Methods of reproduction in microorganisms and their growth in food.**
Week 7	**Factors affecting microbial growth in food (temperature, humidity, pH...).**
Week 8	**Microbial control in food (sterilization, preservation, heat treatment).**
Week 9	**Introduction to Microbial Contamination of Food – Sources and Hazards.**
Week 10	**Foodborne pathogens (Salmonella, E. coli, Listeria...).**
Week 11	**Beneficial microbes in food (yeasts, lactic acid bacteria).**
Week 12	**Microbial fermentation and its applications in foods (e.g., yogurt, pickles, cheese).**
Week 13	**Microbial fermentation and its applications in foods (e.g., yogurt, pickles, cheese).**
Week 14	**Methods of detecting microorganisms in food (culture, staining, counting).**
Week 15	**Methods of detecting microorganisms in food (culture, staining, counting).**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (weekly practical)	
week	**Material Covered**
Week 1	**Staining of bacteria**
Week 2	**Acid fast bacteria staining method**
Week 3	**staining Spores**
Week 4	**Bacterial motility assay using a hanging drop**
Week 5	**Methods of counting bacteria**
Week 6	**How to calculate the area of a microscopic field:**
Week 7	**Counting bacteria by poured dish method:**
Week 8	**Sterilization methods:**
Week 9	**Sterilization methods:**
Week 10	**Nutritional media:**
Week 11	**Method of inhibiting bacterial growth**
Week 12	**Method of inhibiting bacterial growth**
Week 13	**Detection of pathogenic bacteria in food**
Week 14	**Detection of pathogenic bacteria in food**
Week 15	**Methods of counting bacteria**
Week 16	**Exam**

3-تقنيات مختبرية

Delivery Plan (Weekly Syllabus)	
Week	**Material Covered**
Week 1	**For the most part, there is no need to find out for experienced guides and guides, because they will serve**
Week 2	**Use laboratory tools correctly**
Week 3	**Preparing solutions for cleaning glassware and tools and how to use them**
Week 4	**Types of blenders used in laboratories, specifications of each type, and the extent of its suitability for samples**
Week 5	**Preparation and calibration of various standard chemical solutions**
Week 6	**Preparation and calibration of various standard chemical solutions**
Week 7	**Handling different chemicals and methods of preserving them in the laboratory**

Week 8	**Handling different chemicals and methods of preserving them in the laboratory**
Week 9	**Operation and maintenance of the water treatment plant**
Week 10	**Operation of sensitive balances, their types, maintenance and calibration**
Week 11	**Operation and maintenance of various types of public places**
Week 12	**Operation and maintenance of hydrometers and electrical equipment and maintenance of electrodes**
Week 13	**Food Analysis Equipment Maintenance**
Week 14	**Use and calibrate a spectrophotometer**
Week 15	**Use and calibrate a spectrophotometer**
Week 16	**Operation and maintenance of milk composition analysis equipment**

Delivery Plan (weekly practical)	
week	**Material Covered**
Week 1	**Identify the most common laboratory tools and equipment and their uses.**
Week 2	**Use laboratory tools correctly**
Week 3	**Prepare and clean glassware and tools and how to use them**
Week 4	**Types of boilers used in laboratories and specifications of each type.**
Week 5	**Preparation and calibration of the seven different standard chemical solutions**
Week 6	**Preparation and calibration of the seven different standard chemical solutions**
Week 7	**Handling of the different chemical materials and methods of preserving them In the laboratory, the seven**
Week 8	**Handling of the different chemical materials and methods of preserving them In the laboratory, the seven**
Week 9	**Operation and maintenance of the distilled water device.**
Week 10	**Operation and maintenance of sensitive balances of their types, maintenance and calibration.**
Week 11	**Operation and maintenance of various types of microscopes**
Week 12	**Maintenance of food analysis devices**
Week 13	**Food Analysis Equipment Maintenance**
Week 14	**Use and calibrate a spectrophotometer**
Week 15	**Use and calibrate a spectrophotometer**
Week 16	**Operation and maintenance of milk composition analysis equipment**

المرحلة الأولى – الفصل الثاني

1- الامن البايولوجي

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	**Simple introduction to biosecurity and its importance in food**
Week 2	**What are microorganisms? (Bacteria, viruses, fungi)**
Week 3	**How do microorganisms spread in food?**
Week 4	**Causes of biological food contamination**
Week 5	**Basics of personal hygiene when handling food**
Week 6	**Concept of sterilization and disinfection and why we need them**
Week 7	**Personal protective equipment: gloves, masks, clothing**
Week 8	**How to organize the workplace to prevent contamination**
Week 9	**Common foodborne illnesses and their symptoms**
Week 10	**How to prevent food contamination in kitchens or factories**
Week 11	**Importance of safe food storage**
Week 12	**What to do in case of contamination? Simple control steps**
Week 13	**Practical examples and simple exercises in hygiene and disinfection**
Week 14	**Summary and practical application + field visit or educational video about biosecurity in food**
Week 15	**What to do in case of contamination? Simple control steps**

Delivery Plan (Weekly Lab. Syllabus)	
Week	**Material Covered**
Week 1	**Familiarization with lab and safety rules**
Week 2	**Microscope use: observing bacteria and fungi samples**
Week 3	**Hands-on practice: personal hygiene and proper handwashing**

Week 4	**Demonstration of sterilization techniques (boiling, chemical disinfectants)**
Week 5	**Practice wearing personal protective equipment (PPE)**
Week 6	**Cleaning and disinfecting a simple workstation**
Week 7	**Organizing a mock food preparation area for contamination prevention**
Week 8	**Identifying contamination points in food handling through role-play**
Week 9	**Sampling and testing for common foodborne pathogens (simplified)**
Week 10	**Proper storage of food samples and temperature monitoring**
Week 11	**Waste disposal exercises following biosecurity guidelineS**
Week 12	**Simulated contamination scenario and control response**
Week 13	**Simple lab tests for detecting bacteria in food samples**
Week 14	**Group project: creating a biosecurity plan for a small food operation**
Week 15	**Review, practical exam, or virtual/field visit to food production facility**

2- كيمياء فيزياوية

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Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	Introduction to Physical Chemistry
Week 2	gases
Week 3	Molecular properties of gases
Week 4	Behavior of real gases at low temperatures and high pressure
Week 5	Thermodynamics
Week 6	Heat capacity, enthalpy
Week 7	Spontaneous processes and entropy (S)
Week 8	Gibbs Free Energy
Week 9	Applications to chemical reactions
Week 10	Calculating changes in energy, enthalpy, and entropy
Week 11	The concept of chemical equilibrium

Week 12	Le Chatelier's principle
Week 13	Chemical Kinetics
Week 14	ionic equilibrium
Week 15	Buffer Solutions,Solubility Product (Ksp),Precipitation and Equilibrium in Ionic Solutions

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Laboratory Safety Instructions
Week 2	Measurement of mass, volume, and density
Week 3	Boyle’s Law, Measure the relationship between pressure and volume at a constant temperature.
Week 4	The relationship between volume and temperature at constant pressure.
Week 5	An experiment based on collecting hydrogen gas and using the ideal gas law.
Week 6	Use a simple calorimeter to measure the specific heat of a metal.
Week 7	Enthalpy measurement of a chemical reaction

3- هندسة معامل أغذية

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to food laboratory engineering
Week 2	Selecting a food laboratory location
Week 3	Food laboratory planning

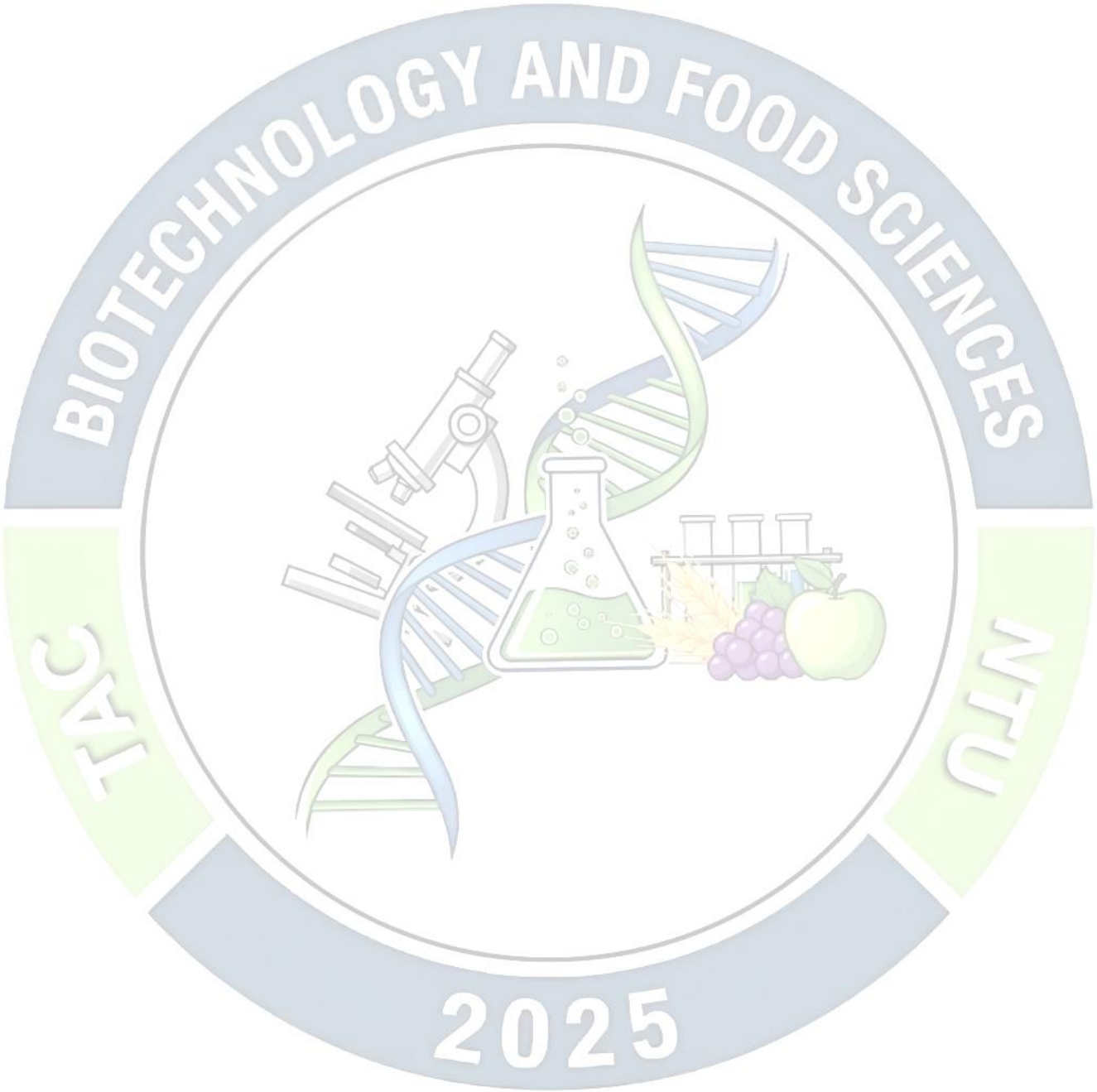
Week 4	Laboratory infrastructure
Week 5	Equipment and production line layout
Week 6	Design of public facilities
Week 7	Occupational safety in food laboratories
Week 8	Quality systems in the food industry
Week 9	Building materials and interior fittings
Week 10	Economic factors in plant design
Week 11	Process analysis and performance efficiency
Week 12	Environmental considerations
Week 13	Designing a prototype for an integrated food laboratory
Week 14	Discussion of design projects and evaluation
Week 15	General review and preparatory test

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Discussion of course content, division into groups, presentation of food factory models, discussion of student expectations.
Week 2	Analysis of real food factory locations
Week 3	Preliminary sketch of a food factory layout
Week 4	Representation of infrastructure networks
Week 5	Designing the distribution of equipment and production lines
Week 6	Calculating the cooling load for cold rooms
Week 7	Preparing a model occupational safety plan
Week 8	Analyzing production risks and identifying critical control points (CCPs)
Week 9	Evaluate suitable building materials for laboratories
Week 10	Preparing a simplified feasibility study for a food laboratory
Week 11	Drawing and analyzing a process flow diagram (PFD)
Week 12	Designing a simplified liquid waste treatment system
Week 13	Initiate an integrated food laboratory design project
Week 14	Final project presentation
Week 15	Comprehensive practical review and evaluation

4- مبادئ انتاج حيواني

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	Introduction to Animal Production and Food Science and Their Importance
Week 2	Types of Farm Animals and the Uses of Food for Humans
Week 3	Basics of Animal Farming Systems and Basic Food Components
Week 4	Environmental Factors Affecting Animal Production and Food Properties
Week 5	Types of Animal Feed and How to Choose Appropriate Feed
Week 6	Effects of Nutrition on Animal Health and Production, and Energy Value in Food
Week 7	Daily Animal Care and Principles of Food Safety
Week 8	Common Animal Diseases and Prevention Methods, and Food Contamination
Week 9	Basic Treatment for Animals and Food Preservation and Processing Methods
Week 10	Animal Welfare and Humane Treatment, and the Role of Technology in Food Science
Week 11	Animal Housing Organization and Farm Management, and Food Quality Analysis
Week 12	Vitamins and Minerals in Feed and Food and Their Health Impact
Week 13	Human Nutrition and Its Effect on General Health and Its Relation to Animal Production
Week 14	Practical Projects and Applications in Animal Production and Food Science
Week 15	Field Visits and Practical Activities in Farms and Food Laboratories

Delivery Plan (Weekly Lab. Syllabus)	
Week	Material Covered
Week 1	Identifying types of farm animals on the farm
Week 2	External examination of animals and breed identification
Week 3	Assessing feed quality and recognizing feed types
Week 4	Preparing suitable feed rations for animals
Week 5	Observing animal behavior and environmental effects
Week 6	Measuring basic vital signs (weight, temperature, pulse)
Week 7	Cleaning animal housing and maintaining hygiene standards
Week 8	Noticing common disease signs and reporting them
Week 9	Safe handling and animal welfare during examination
Week 10	Practical methods for feed storage and preservation
Week 11	Managing animal housing and space organization practically
Week 12	Simple laboratory analysis of feed samples
Week 13	Identifying vitamins and minerals in feed practically
Week 14	Preparing a small practical project for herd or farm management
Week 15	Field visit to a farm or lab and applying acquired skills


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