



2016

# Multani Mal Modi College, Patiala

Unit Planning M.Sc. – I Food & Nutrition

Department of Biotechnology



**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-I (SEMESTER-I)**  
**Paper: 1**  
**(2016-17)**  
**Subject: Biochemistry-I**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p>Introduction to biomolecules: Molecular structure &amp; hydrogen bonding of water; Hydrophobic &amp; Hydrophilic interactions; Ionizations of water; pH scale; acids, bases and buffers; buffers of biological importance; fitness of aqueous environment for living organisms.</p> <p>Carbohydrates: Classification, structure, functions &amp; properties; monosaccharides, disaccharides &amp; polysaccharides; general functions of Carbohydrates.</p>
<p>Carbohydrate Metabolism: Glycolysis, TCA cycle &amp; its amphibolic nature, Glyoxylate cycle, Pentose phosphate pathway &amp; its metabolic significance; Gluconeogenesis, Glycogenesis, Glycogenolysis; Regulation of carbohydrate metabolism.</p> <p>Biological oxidation: Theory of biological oxidation; respiratory chain; mechanism of oxidative phosphorylation; inhibitors of oxidative phosphorylation.</p>
<b>TILLMST-II</b>
<p>Lipids: Classification, structure, function &amp; properties of lipids; phospholipids, lipoproteins, oxidation, rancidity, characterization of fats; essential fatty acids.</p> <p>Lipid Metabolism: Biosynthesis &amp; catabolism of fatty acids; regulation of fatty acid metabolism.</p> <p>Metabolism in well fed state &amp; starvation.</p> <p>Principles of Bioenergetics: concept of free energy; oxidation reduction reactions; high energy compounds; concept of metabolism &amp; involvement of enzymes &amp; coenzymes in metabolic reaction.</p> <p>Vitamins &amp; Food additives: Sources, classification dietary requirement &amp; functions of vitamins (fat soluble and water soluble), vitamin coenzyme relationship.</p>
<b>TILLFINAL EXAM</b>
<p>Environmental Pollution &amp; Heavy Metal poisons:- Corrosives, Irritants, Heavy metal poisons, Lead, Mercury, Aluminum, Pesticides &amp; Insecticides, Chemical Carcinogens, Occupational or industrial hazardous agents, Air Pollutants, Toxic Substances in Foodstuffs.</p>

**Mode of Assessment**

<b>Mode of Assessment</b>		
<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class – M.Sc. Part 1 (Semester-1)**

**Paper: II**

**Subject: General Microbiology**

**Max Marks: 54**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>
<p>History of Microbiology: - The microscope, Laboratory techniques &amp; Pure culture, Protection against infection, Microbiology and society.</p> <p>Bacteria: - Morphology, size, shape, bacterial cell wall, plasma membrane &amp; cytoplasmic inclusions.</p> <p>Microbial Metabolism: - Energy production by anaerobic &amp; aerobic processes, Energy production by photosynthesis.</p> <p>Growth and Nutrition of Bacteria: - Bacterial growth curve, Nutritional requirement for growth, Culture media, Environmental factors influencing growth, Culture techniques.</p>
<b>TILLMST-II</b>
<p>Food Hazards of Microbial Origin: - Introduction, Food borne disease, Food borne intoxications, Infections, Mycotoxins.</p> <p>Food Contaminants: - Naturally occurring toxicants in animal &amp; plant food. Anti-nutritional factors in foods, Environmental contaminants.</p> <p>HACCP (Hazard Analysis Critical Control Point) :- Introduction, Need, Benefits and Principles.</p>
<b>TILLFINAL EXAM</b>
<p>Biosensors: - Introduction, Types of biosensor, Biosensors for assessment of heavy metal ions in polluted water, Applications of biosensors.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**Class – Msc. Part 1 (Semester-I)**  
**Paper: III**  
**Subject: Advance Nutrition-I**

**Max Marks: 54****Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>
<p>Definition and Concepts of Health, Nutrition, Nutrients, Nutritional Status, Nutritional Care, Malnutrition, Nutrient Density, The Food Guide Pyramid &amp; Brief History of Development of Science of Nutrition.</p> <p>Food Composition Tables: Importance, Uses &amp; Limitations.</p> <p>Food Exchange Lists: Importance &amp; Uses.</p> <p>Carbohydrates: Review of Digestion, Absorption &amp; Utilization of Carbohydrates, Dietary types &amp; Sources of Carbohydrates, Functions &amp; Importance of various Carbohydrates- Lactose, Starch, Indigestible carbohydrate (fiber), Requirements, Dietary carbohydrates &amp; Coronary Heart Disease, Lactose Intolerance, Sugar &amp; its relation to Dental caries, Artificial sweeteners, Alcohol &amp; Nutrition.</p>
<b>TILLMST-II</b>
<p>Proteins &amp; Amino acids: Review of Digestion, Absorption &amp; Utilization of Protein, Sources of Protein- Complete &amp; Incomplete Proteins, Protein as a source of energy, Protein requirements, Study of Nitrogen balance, Amino Acid Imbalance &amp; Toxicity, Evaluation of Dietary Protein Quality, Methods of correcting Amino Acid Deficiency, Effects of Protein Deficiency &amp; Excess.</p>
<b>TILLFINAL EXAM</b>
<p>Fats &amp; Lipids: Review of Digestion, Absorption &amp; Utilization of fats, Sources of fat in the diet Visible and Invisible, Saturated &amp; Unsaturated Fatty acids, Essential Fatty acids (Requirements, Sources &amp; Functions &amp; Symptoms of Deficiency).Requirements of fats, Effects of Deficiency &amp; Excess, Lipid Composition of Blood &amp; Factors affecting the same, Storage of fat- factors associated with Normal &amp; Abnormal storage, Role of fat in the Etiology of Obesity, Atherosclerosis &amp; Coronary Heart Disease.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class Msc.Part 1 (Semester-1)**

**Paper: IV**

**Subject:Community Nutrition**

**Max Marks: 54**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>
<p>Factors affecting food consumption: Agricultural, Socio-economic, Psychological. Food, Nutrition &amp; Health policies. Causes of Malnutrition: Environmental, Socio-economic &amp; Cultural. Measures to overcome Malnutrition &amp; need for an integrated approach to solve problems of malnutrition Role of new, reinforced &amp; fortified foods. Role of national &amp; international organization engaged in nutrition programmes. Role of nutrition &amp; health programmes in the country for vulnerable sections of population.</p>
<b>TILLMST-II</b>
<p>Nutrition Education: Scope &amp; methods; Teaching aids: Selection, preparation &amp; Uses. Principles of planning, executing &amp; evaluating nutrition education programmes.</p>
<b>EXAM</b>
<p>Methods for assessment of nutritional status: Dietary Surveys Biochemical Investigations Clinical Signs &amp; Anthropometric Measurements</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**Class-M.Sc..Part I (Semester-II)**  
 Paper: I  
**Subject-Biochemistry-II**

Max Marks: 54

Maximum Time: 3 Hrs.

<b>TILLMST-I</b>
<p>Amino Acids: Structure, Classification, Properties, Amino acids as building blocks of proteins, Essential amino acid, Titration curve of amino acids, Peptide bond.</p> <p>Amino Acids Metabolism: General pathways for metabolism of amino acids, Transamination, Deamination, Decarboxylation, Detoxification of ammonia, Urea cycle.</p> <p>Proteins: Structure of proteins, Primary, Secondary, Tertiary &amp; Quaternary, Determination of primary structure of protein, Denaturation of proteins, Functional diversity of protein.</p> <p>Protein Metabolism: Bio synthesis of protein &amp; its regulation (Lac. &amp; Tryp operons).</p>
<b>TILLMST-II</b>
<p>Nucleic Acids: Classification &amp; Structure of nucleic acids, Purine &amp; Pyrimidine bases, Nucleosides &amp; Nucleotides, Function of RNA, DNA, and Denaturation of DNA.</p> <p>Nucleic Acids &amp; Metabolism: Biosynthesis &amp; Degradation of purine &amp; pyrimidine nucleotides &amp; their regulation: Replication &amp; Transcription.</p> <p>Enzymes : Structure, Properties &amp; Classification, Enzyme specificity, Factors affecting enzyme activity, Enzyme kinetics, Derivation of MICHAELIS-MENTON equation, Lineweaver-Burk plot, Enzyme inhibition, Competitive, Non-competitive, Feedback &amp; allosteric inhibition, Use of enzymes in food.</p>
<b>TILLFINAL EXAM</b>
<p>Gene Cloning: Recombinant DNA technology, Genetic engineering, Cleavage of DNA into fragments, Gene cloning, Gene library, Polymerase chain reaction, Probes, Application of recombinant DNA technology.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class: M.Sc.Part 1 (Semester-II)**

**Paper: II**

**Subject: Food & Industrial Microbiology-II**

**Max Marks: 54**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>
<p>An Introduction to Industrial Microbiology: History, General strategy of metabolism, General concepts of respiration &amp; fermentation, Enzymes.</p> <p>Bioreactor: Design of Bioreactor, Types, Operation principles.</p> <p>Microbiology of Food: Microbial flora of fresh foods, Microbial spoilage of foods, Microbiological examination of foods, Fermented foods.</p> <p>Food Preservation: Principles and methods; Food spoilage; Methods of preservation; Preservation by low temperature, high temperature, preservatives, osmotic pressure &amp; dehydration.</p>
<b>TILLMST-II</b>
<p>Fermentative Productions: Organic acids- citric acid, acetic acid, lactic acid, Organic solvents, Ethanol, Glycerol.</p> <p>Dairy Microbiology: Milk, Composition &amp; Constituents of milk, Processing of milk, Types of processed milk, Dairy products, Yoghurt production.</p> <p>Microbes in Economic Use : Beneficial activities of microbes, Single cell proteins, Microbes in food processing, industry, organic acid production, dairy industry, in improvement of soil, medicine, as tools in biological research, Harmful activities of microorganisms.</p>
<b>TILLFINAL EXAM</b>
<p>Drinking Water &amp; Sewage Microbiology: Drinking water purification, Determination of water potability, Sewage microbiology, Composition, Classification, Characteristics, Disposal &amp; treatment.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class – MSc. Part 1 (Semester-II)**

**Paper: III**

**Subject: Advance Nutrition-II**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p>Recommended Dietary Allowances: Definition &amp; Applications in general.                      Nutritional Requirements &amp; R.D.A. for Entire Life Span.                      Body Composition, Methods of assessing Body Composition                      Energy:Energy Content of Food.                      Energy measurements Direct &amp; Indirect Calorimetry.                      Energy Expenditure: Factors affecting Basal Metabolism, Maintenance, Requirements &amp; Activity.                      The share of three main Energy Nutrients Carbohydrates, Fats &amp; Proteins Specific Dynamic Action.</p>
<b>TILLMST-II</b>
<p>Vitamins: Importance of vitamins in Human Health, Development of Vitamin Concept, Fat Soluble Vitamins (A, D, E, K), Water Soluble Vitamins (Thiamine, Riboflavin, Niacin, B<sub>12</sub>, and Folic acid, Pyridoxine, Biotin, and Pantothenic acid &amp; Ascorbic acid) - Physiological Functions, Dietary Sources, Determination of Requirements, Recommended Allowances, and Human Deficiency &amp; Excess.</p>
<b>TILLFINAL EXAM</b>
<p>Mineral elements: Calcium, Phosphorus, Magnesium, Sodium, Potassium, Sulphur, Iron, Trace Elements: Iodine, Fluorine, Zinc, Cobalt, Selenium, Manganese- Physiological Function, Sources, Recommended Allowances Deficiency &amp; Excess.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class – M.Sc. Part 1 (Semester-II)**

**Paper: IV**

**Subject: Food Science**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p>Relation of cookery to colloidal chemistry: Definition of colloidal system, Altering degree of dispersion, Hydrophobic &amp; Hydrophilic colloids, Stabilization of colloidal, Properties, Surface tension, Adsorption, Foam formation, Rheology, Gel formation &amp; Emulsions.</p> <p>Methods of Cooking &amp; Effect of cooking &amp; processing on digestibility &amp; Nutritive value of foods. Sugar cookery: Sources, Uses &amp; Properties, Crystallization of sugar, Stages of sugar cookery: Fondant, Fudge, Caramel &amp; Brittles.</p> <p>Starch cookery:</p> <ul style="list-style-type: none"> <li>(i) Sources &amp; Uses of starch, Gelatinization.</li> <li>(ii) Flours: Composition &amp; baking qualities, batters &amp; dough, Leavening agents.</li> <li>(iii) Cooking &amp; parboiling of rice.</li> </ul> <p>Fats &amp; Oils: Sources &amp; extraction of edible oils &amp; fats, changes in fats during storage &amp; cooking, Uses of fats.</p>
<b>TILLMST-II</b>
<p>Meat: Structure, Constituents of meat, Post-mortem changes, Methods of cooking &amp; changes in meat during cooking, Tenderness, &amp; Juiciness.</p> <p>Eggs: Structure, composition &amp; selection, Coagulation of egg proteins, eggs cooked in shells, poached eggs, omelets. Milk &amp; Milk Products: Composition &amp; Constituents of milk, Coagulation of milk protein, Curd, Cream, Butter &amp; Cheese.</p> <p>Pulses &amp; Legumes: Composition, Methods of processing &amp; cooking, Effect of processing such as roasting, parching, soaking, germination &amp; fermentation.</p>
<b>TILLFINAL EXAM</b>
<p>Vegetables &amp; Fruits: Structure, Texture, Pigments &amp; acids in vegetables &amp; Fruits, Browning reaction, Pectic substances, theory of pectin-gel formation, Testing of pectin, Factors affecting gel formation. Organoleptic evaluation of foods.</p>

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**UNIT PLAN**  
**M.Sc.-II (SEMESTER-III)**  
**Paper: 1**  
**(2016-17)**  
**Subject: Human Physiology**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p>Body Fluids: Blood and Lymph                      Significance of Body fluids, Distribution of body fluids, Dehydration. Composition and functions of blood. Plasma proteins , RBCs, PCV, Hemoglobin, WBCs , Platelets and their functions. Formation of Lymph, composition and functions of lymph and Lymph nodes.                      Cardiovascular System: Structure of Heart, Cardiac Cycle (Cardiac Muscle),Heart Sounds, Cardiac Output, Arterial Blood Pressure.                      Reproductive System: Male and female reproductive systems. Spermatogenesis, Menstrual cycle, ovulation , pregnancy &amp; lactation, fertility control.                      Digestive System:Parts of Digestive System, their secretions and functions (stomach, pancreas, gall bladder, intestine),Movements of GIT, digestion and absorption of carbohydrates, fats and proteins.</p>
<b>TILLMST-II</b>
<p>Respiratory System: Anatomy of Respiratory tract, Lung Volume and Capacities, Capacities, Exchange of respiratory gases, Transport of respiratory gases, Disturbances in respiration. Endocrinology: Hormonal action, Secretion of pituitary, thyroid, parathyroid, pancreas and adrenal glands. Excretory System: Structure and functions of kidney, nephron as structural and functional unit of kidney, Urine formation, Concentration of urine, Dialysis and Diuretic. Anatomy of Respiratory tract, Lung Volume and Capacities, Exchange of respiratory gases, Transport of respiratory gases, Disturbances in respiration.</p>
<b>TILLFINAL EXAM</b>
<p>Nervous System: Introduction, Neurons as structural and functional unit of nervous system, synapse and neurotransmitters, Autonomic nervous system, Sympathetic and parasympathetic divisions.</p>

**Mode of Assessment**

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1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

UNIT PLANNING (SESSION 2016-17)  
**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-III)**  
**Paper: II**

**Subject: Therapeutic Nutrition**

**Max Marks: 75**

**Maximum Time: 3 Hrs**

<b>TILLMST -1</b>
<p>Introduction to Therapeutic Nutrition:-Objectives of modified diets.Effects of illness on food acceptance and utilization.Therapeutic modifications of normal diet:- normal, soft, liquid diets, parenteral feeding.</p> <p>Etiology, clinical and biochemical manifestations, nutrition and dietary management for the followindiseases/conditions.</p> <ol style="list-style-type: none"> <li>1. Febrile &amp; Surgical conditions, Burn diets</li> <li>2. Underweight, Overweight &amp; Obesity</li> <li>3. Metabolic disorders: Diabetes mellitus: Juvenile &amp; adult onset, types of insulin &amp; their action, Oral hypoglycemic drugs, Gout.</li> </ol>
<b>TILLMST-II</b>
<p>Gastrointestinal disorders:peptic ulcer – gastric and duodenal ,Diarrhea: acute &amp; chronic ,Constipation: atonic &amp;spastic,Malabsorption Syndromes—Carbohydrate and Fat Intolerance: Sprue, Celiac disease.</p> <p>Liver and gall bladder diseases :Infective hepatitis, Cirrhosis . Cholestasis: acute &amp; chronic, Cholelithiasis . Renal disorders:Glomerulonephritis ,Nephrotic Syndrome . Renal failure : acute &amp; chronic ,Renal calculi</p>
<b>TILLFINAL EXAM</b>
<p>Cardiovascular disorders:Hypertension ,Atherosclerosis,Coronary heart disease.</p>

**Mode of Assessment**

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1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

UNIT PLAN  
M.Sc.-II (SEMESTER-III)  
Paper: III

Subject: Maternal Nutrition

Max Marks: 54

Maximum Time: 3 Hrs

TILLMST-I	
Importance of maternal and child nutrition.  Physiological and biochemical changes during pregnancy: placenta, hormones, blood circulation, gastrointestinal changes, weight gain, basal metabolism and complications of pregnancy. Effect of maternal nutrition on nutritional status of offspring  Pregravid nutrition and fetal out come. Maternal dietary intake and fetal out come Food supplementation and fetal out come. Physiological changes during lactation – anatomy of breast, first milk, breast feeding reflexes, factors affecting lactation.  Breast feeding – starting breast feeds, position of mother and baby while feeding and some practical considerations related to breast feeding. Code on breast feeding and marketing of formula foods, artificial feeding, breast feeding versus bottle feeding.	
TILLMST-II	
Weaning and supplementary foods. Feeding of premature and Immature (small for date) babies Monitoring growth and nutritional status of infants and children, concept of GOBI for better child health, Immunization.	
TILLFINAL EXAM	
Maternal and child health Programs in India.- ANP. Supplementary Feeding Programs, Special Nutrition Programs Balwadi Nutrition Programs, Mid-day Meal Programs Prophylactic doses (vitamin A and iron), ICDS.	

**Mode of Assessment**

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UNIT PLANNING (SESSION 2016-17)  
**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-III)**  
**Paper: 1V**  
**Subject: Institutional Food Management**

Max Marks: 54

Maximum Time: 3 Hrs

<b>TILLMST-I</b>
<p><b>Historical Development of Food Service Institution:</b> Historical Development of Food Service Institutions and Review of different types of Institutional Food Service Operations--- Commercial and Non-commercial Food Service Institutions</p> <p><b>Meal Planning :</b> Basic factors in successful institutional meal planning, Considerations with regard to Religion, Region, Availability of Food and Season, Food habits, Equipment, Physical plant and Financial resources. Techniques of writing menus. Types of menus</p>
<b>TILLMST-II</b>
<p><b>Food Preparation and Service:</b> Food Production Systems ,Food Production Process with emphasis on Standardization of Recipes. Effective use of Left Overs. Types and Styles of Food Service in different Institutions--- Formal and Informal Food Service.</p>
<b>TILLFINAL EXAM</b>
<p><b>Physical Plant :-</b> Its location, Floor planning, Layout Design and Space Allowances for Preparation Activities i.e. Receiving, Storage. Pre-Preparation, Cooking, Washing, Serving, Dining and Waste Disposal Units.</p>

**Mode of Assessment**

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3	Attendance	20%

UNIT PLANNING (SESSION 2016-17)  
**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-IV)**  
**Paper: 1**

**Subject: Research Methodology and Statistics**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p>Sampling Techniques - Definition of population and sample. Need for sample and methods of sample selection-simple random, stratified random, systematic, cluster, multistage and quota samples, sampling and non-sampling errors, Methods of reducing errors and bias.</p> <p>Principles of Experimentation: Planning of scientific experiment. Analysis of variance for simple para design like, completely Randomized design and Randomized block design.</p> <p>Report writing, foot notes and bibliographical citation.</p> <p>Thesis writing, principles and techniques of thesis writiMethods of collecting data: Conducting statistical enquiries to collect primary data.</p> <p>Sources of secondary data, collection scheme, interview methods of enquiry, qualities essential in interview, training of interviewers, Editing and coding the data.</p> <p>Classification and organization of data, classification by categories and measurement, coding and tabulations on master sheets. Methods of securing accuracy on tabulation.</p>
<b>TILLMST-II</b>
<p>Frequency distribution tables for discrete and continuous variable distribution.</p> <p>Graphical and Diagrammatic representation: Bar, Pie and scatter diagram. Histograms, Frequency Polygon, frequency curve, logarithmic graphsng.</p> <p>Measurements of Central Tendency: Mean Median and Mode, their relative advantages and disadvantages. Measures of dispersion, range, mean deviation and standard deviation.</p> <p>Bivariate frequency distribution: Correlation, coefficient and its interpretation, fitting a linear regression and interpretation of regression coefficients, Rank correlation.</p> <p>Probability: Definition and numerical problems relating to probability, conditional</p>

probabilities, binomial and normal distribution.

**TILLFINAL EXAM**

Test of significance - Large sample test, Test based on standard normal distribution, t and F test, chi square test for independence of attributes in a contingency table.

Elementary knowledge of use of computer programming

**Mode of Assessment**

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**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-IV)**  
**Paper: II**

**Subject: Clinical NutritionaAnd Diet Counseling**

**Max Marks: 54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<p><b>Food service in health care facilities:</b> Role of health care professionals with emphasis on role of dietitian, Code of ethics, Factors in patient care with emphasis on needs of the patient, Feeding of patient, Team approach to nutritional care, Comprehensive care services, Physical handicaps and Rehabilitation of patient, Nutritional care of the terminally ill or hospice patient. <b>Effect of drugs on nutrition:</b> Alterations in taste, smell, appetite and food intake Alterations in nutrient absorption, Alterations in nutrient metabolism, Alterations in nutrient excretion.</p> <p><b>Effect of food on drug utilization:</b> Alterations in drug absorption, Alterations in drug metabolism.</p> <ul style="list-style-type: none"> <li>• How body's Homeostatic Mechanisms like Acid-Base Balance, Fluid and Electrolyte Balance affect Drug Excretion.</li> </ul>
<b>TILLMST-II</b>
<p>Role of Antioxidants, Probiotics and Functional foods in health and disease.                      Nutritional Assessment and Dietary Counseling: Nutritional Assessment: Historical Data (medical, social, drug, diet history), Anthropometric Measures, Clinical and Physical Findings, Laboratory Data.                      Nutrition Care Plans:- Developing, implementing and evaluating nutrition care plans                      Dietary Counseling:- Attributes of successful counselor, steps in counseling process, counseling guidelines. Characteristics, causes, symptoms, nutrition therapy and counseling in Eating Disorders:- Anorexia Nervosa, Bulimia/Binge Eating                      Etiology, symptoms, diagnosis, treatment and dietary counseling for Food Allergies.</p>
<b>TILLFINAL EXAM</b>
<p>Diet and Cancer- Risk factors in cancer incidence, metabolic effects of cancer, nutritional effects of cancer therapy, nutritional management and dietary counseling and role of food in prevention of cancer.</p>

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**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-IV)**  
**Paper: 1II**  
**Subject: Problem in Human Nutrition**

**Max Marks:54**

**Maximum Time: 3 Hrs**

<b>TILLMST-I</b>
<ul style="list-style-type: none"> <li>• Prevalence, etiology and prevention of the Energy Protein Malnutrition, Vitamin A deficiency, Rickets, Osteomalacia and osteoporosis, Nutritional anemia, Goiter, Fluorosis</li> <li>• Etiology, Consequences and Nutritional Adaptations in the conditions: Low calorie, Low protein, Low vitamin A, Low calcium and iron.</li> <li>• Problems, nutritional requirements and dietary management in special environmental conditions of: High Attitude, Space travel, Heavy manual labour in tropical climate, Floods and famines</li> </ul>
<b>TILLMST-II</b>
<ul style="list-style-type: none"> <li>• Hazards of Food Toxins - natural, chemical and microbial</li> <li>• Food adulteration- common adulterants, their effects on human health, laws to curb adulteration</li> </ul>
<b>TILLFINAL EXAM</b>
<ul style="list-style-type: none"> <li>• Environmental pollution - air, water, indoor pollutants, smoking and tobacco and Educating the community about control of environmental pollution.</li> </ul>

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**MULTANI MAL MODI COLLEGE, PATIALA**  
**UNIT PLAN**  
**M.Sc.-II (SEMESTER-IV)**  
**Paper: 1V**  
**Subject: Institutional Food Management**

Max Marks: 54

Maximum Time: 3 Hrs

<b>TILLMST-I</b>
<p><b>Organization and Management:</b> Definition, types and structure. Management: Definition, functions, delegation of responsibilities, tools of managements such as organization chart, job description, job specification, job analysis, job evaluation and work sheet.</p> <ul style="list-style-type: none"> <li>• <b>Personnel Management:</b> Personnel and leadership qualities and responsibilities of food administrator and importance of good human relationships in organization. Communication as a factor in improving efficiency. Criteria for selection of staff personnel, employment conditions, employee training, role of employee unions, welfare provisions for labour.</li> <li>• Labour laws regarding health and safety of employees, general safety rules in food preparation and service areas, accident prevention, welfare policies.</li> </ul>
<b>TILLMST-II</b>
<p><b>Equipment for food services :</b> types of equipment ,criteria for their selection, operation, care and maintenance of equipment</p> <p><b>Hygiene and Sanitation:</b> Health examination of personnel ,Importance of personal cleanliness in handling and serving food,Cleaning and hygienic handling of utensils and other equipment,Insect and rodent control.</p>
<b>TILLFINAL EXAM</b>
<ul style="list-style-type: none"> <li>• Factors affecting cost control, food cost, labour cost, operating and other expenses</li> <li>• Accounting procedures, Budgets and records for cost control.</li> </ul>

**Mode of Assessment**

<b>Mode of Assessment</b>		
<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

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