Baba Farid University of Health Sciences

Ordinances & Syllabus

M.Sc. Nutrition & Dietetics

(2 Years Degree Programme)

Faridkot -151203

Ordinances
M.Sc. Nutrition & Dietetics

1. Duration of Course:

Duration of Master of Science in Nutrition & Dietetics shall be of two years.

2. Eligibility for admission

a) This course shall be open to a candidate who have passed BDS/BAMS/BHMS froma recognized institution or a regular Bachelors degree in the area of life-sciences, health sciences or allied medical sciences (Nutrition, Home science, Clinical nutrition & dietetics, Applied nutrition, Food technology, Biotechnology, Microbiology, Biochemistry, Genetics, Botany, Zoology, BPT, BDS, MBBS or equivalent examination) from a College/Institution/University recognized by Baba Farid University of Health Sciences, Faridkot.

OR

b) Any other examination recognized by the Board of Management of this University as an equivalent course / examination thereto, from time to time.

3. Medium of Instructions

The medium of instruction during the course and examinations shall be English.

4. Examination Schedule:

4.1 The examination shall be held twice a year in the months of May/June and November/December or on such other dates as may be decided by the Board of Management on the recommendation of Faculty of Medical Sciences and Academic Council.

4.2 Normally, the University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than four and not more than six months between the two examinations.

4.3 The last date by which examination forms and fee must reach the Controller of Examinations/Registrar shall be as follows : -

Examinations	without late fee	with late fee of Rs.200/-	with late fee of Rs.500/-	with late fee of Rs.1500/-
May/June	March 1	March 15	March 31	April 15
Nov./Dec.	Sept. 15	Sept. 30	Oct. 15	Oct. 31

Note: Vice-Chancellor may permit acceptance of examination form and fee ten days before the commencement of examination with a late fee of Rs.2000/-. The fee structure is revisable by the University from time to time.

5. First year M.Sc. Nutrition & Dietetics

a) The First Year M.Sc. Nutrition & Dietetics shall be open to a person who has been enrolled for one academic year preceding the examination in a Colleges/Institutions affiliated to this University.

b) The First Year M.Sc. Nutrition & Dietetics shall be conducted by the Head of the Department in the following subjects:-

Subject Code/ Paper	Paper	Max. Marks		Total
		Theory	Practical	
MSCND-01/ Paper-I	Nutrients and Diet Therapy	50	100	200
MSCND-02/ Paper-II	Advanced Food Science and Biotechnology	50		

Note: The awards will be retained by the Heads of the Department for the purpose of calculating Internal Assessment in the Second Year.

6. Thesis

i) Every candidate shall submit a thesis plan to the University within six months from the date of admission.

ii) Every candidate shall carry out work on an approved research project under the guidance of a recognized PG Teacher, the results of which shall be written up and submitted in the form of a thesis by the candidate.

iii) Thesis shall be submitted to the University six months before the commencement of the Second Year Theory Examinations i.e. by 30th November of the preceding year for May/June examinations.

iv) The Vice-Chancellor may allow a candidate to submit the thesis within one month after the date fixed for the purpose with the prescribed late fee.

v) The thesis shall embody the results of the candidate's own research and/or experience and shall contain precise reference to the publications quoted, and must attain a good standard and shall be satisfactory in literary presentation and in other respects and should end with a summary embodying conclusions arrived at by the candidate. The thesis shall be typewritten on one side of the paper (size 11" x 8 ½") with margins of 1½" on each side, bound, indicating on the outside cover its title and the name of the candidate.

vi) The thesis shall be examined by a minimum of two examiners, one internal and one external examiner. Ordinarily, this examiner will not be appointed the External Examiner for theory and Clinical/Practical examination. The candidates who have submitted the thesis in University will be allowed to appear in the final examination. However, the result shall be declared only on receipt of the thesis acceptance from both the examiners.

vii) The internal examiner shall send only report to the University after evaluation of thesis and the evaluated copy will be deposited in the college library for reference of the students. The external examiner shall also send copy of the thesis along with the report to the University. The University shall keep two copies in the University Library for reference of the students.

7. **Second Year M.Sc. Nutrition & Dietetics**

The Second Year Nutrition & Dietetics shall be open to a person

a) who has been enrolled for two academic year preceding the examination in a Colleges/Institutions affiliated to this University.
b) has submitted his/her name to the Controller of Examination/Registrar by the Principal of the College/Institutions with the following certificates:-
   i) of having attended separately in theory and practical/clinical not less than 75% percent of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 10% of the lectures delivered.
   ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.
   iii) Must have submitted the thesis
   iv) of good moral character.

Note: 1) Internal Assessment shall be submitted to the University at least two weeks before the commencement of theory examinations or within one week from the issuance of Roll Numbers by the University. All the colleges shall adopt uniform criteria for Internal Assessment as follows:-

   a) Attendance above 90% to be acknowledged with 10% extra weightage for Internal Assessment.
   b) At least two tests to be held in each year in addition to the pre-final (send up) examination. The Internal Assessment should be the average of all awards of these tests taken together.
   c) **Criteria for calculation of Internal Assessment**
      i) House Examinations - 80%
      ii) Attendance (above 90%) - 10%
      iii) Subject assessment (candidate's conduct and extra curricular participation) - 10%
   d) Additional mandatory requirement for Internal Assessment to be observed by all colleges.

      i) All test marks obtained by candidates will be displayed on Notice Boards of respective departments as and when they are awarded.
      ii) All computations of Internal Assessment of the entire class made by the HOD of the department shall be displayed on the notice board of the department showing individual test marks, advantage of all tests, attendance advantage and subjective assessment and the total Internal Assessment thus derived for at least one week before sending the awards to the Principal's office.
      iii) Professor Incharge/HOD preparing Internal Assessment shall certify that the detailed assessment of the entire class has been displayed on the department Notice Board for at least one week

prior to its being submitted for onward transmission to the University and that adequate opportunity has been given to all the students to file any objections and that the same have been addressed satisfactory.

iv) The Principal forwarding the Internal Assessment to the University shall countersign the above referred certificate of the HOD/Professor Incharge preparing the Internal Assessment.

e) The re-appear/fail students will be re-assessed every time for the purpose of Internal Assessment.

2) If a candidate fulfils the condition laid down in clause 7above, he/ she may be allowed to take the examination.

3) Every candidate before appearing in Second Year Examination must have cleared House Examination securing at least 50 percent marks in both theory as well as practical separately.

c) The Second Year M.Sc. Nutrition & Dietetics Annual Examination shall be held in May/June and the supplementary within six months of the Annual Examination.

d) The Second Year M.Sc. Nutrition & Dietetics examination shall be held in the following subjects and candidate shall be required to pass all the subjects:-

Subject Code/Paper	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Viva	Total	Marks	Int. Assessment	Total	
MSCND-01/ Paper-I	Nutrients and Diet Therapy	80	80	120	**520**	200	80	**280**	**800**
MSCND-02/ Paper-II	Advanced Food Science and Biotechnology	80							
MSCND-03/ Paper-III	Biochemistry, Microbiology and Standards	80							
MSCND-04/ Paper-IV	Research Methodology and Recent Advances	80							

i) Each theory paper shall be of three hours duration.

ii) The minimum number of marks to pass the examination shall be 50% in theory & practical separately.

iii) The candidate who will absent himself/herself from the examination will be deemed to have been failed in the examination.

iv) The candidate who has completed his/her training of two years and has failed in the examination may appear again in a subsequent examination without further training and without submitting a new thesis.

v) The candidate must pass the examination in a maximum of three (1+2) attempts +1 (mercy chance on the discretion of Vice-Chancellor) failing which, he/ she will not be allowed to continue his studies.

8. **Number of Examinations**

The examination shall be conducted twice a year in May/June and November/December or on such dates as determined by the University from time to time.

9. **Grace Marks:**

There shall be no provision for grace marks.

10. **Board of Examiners**

i) There shall be four examiners – two internal and two external.

ii) Professor & Head of the Department shall be the Convener and first examiner. The second Internal Examiner will be appointed by annual rotation from amongst the Professors/Associate Professors/Assistant Professor who fulfills the criteria of PG teacher. In case of non-availability of Professors/Associate Professors/Assistant Professor in the department the teacher who fulfils the minimum requirements to be an examiner may be appointed as Internal Examiner.

iii) The examiners shall be appointed by the University from the teachers working in the Medical Colleges affiliated to it, preferably from the colleges where this course is being run, on the recommendations of the Board of Studies in Medical Sciences and Faculty of Medical Sciences.

11. **Paper setting and moderation of Question Papers:**

The University may get each paper set from External Examiner only. The moderation of question papers may be got done under the directions of the Vice-Chancellor, if necessary.

12. **Evaluation of Answer Books:**

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (table marking) or any other method under the directions of the Vice-Chancellor.

11. **Declaration of Result and minimum pass marks:**

A candidate shall be declared successful only when his thesis has been accepted and the candidate has obtained a minimum of 50% in theory and practical separately.

A successful candidate on the basis of theory and practical marks taken together shall be classified as under: -

Second Class : A candidate obtaining 50% or more marks but less than 60% marks
First Class : A candidate obtaining 60% or more marks
First Class with Distinction : A candidate obtaining 80% or more marks

12. **Award of Degree**

Each successful candidate shall be awarded a degree of M.Sc. Nutrition & Dietetics.

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SYLLABUS

M.Sc. Nutrition & Dietetics

Instructions to Paper Setter

Note: 1) The question paper covering the entire course shall be divided into two sections. Each section to be attempted in a separate answer book and to be evaluated by separate examiners.

2) In each section there shall be 8 questions of 5 marks each and total weight-age being 40 marks

Section A **(Max. marks 40)**

Section B **(Max. marks 40)**

MSCND-01 PAPER – I

Nutrients and Diet Therapy

Objectives

To enable the students to

- To Understand the role of macronutrients.
- The metabolism of macronutrients.
- To know the computation of allowances.
- To impart knowledge on the importance of nutrition during life span.
- To enlighten on the dietary modifications.
- To understand the principles of diet and Nutrition in the cause and treatment of disease.
- To understand the modifications in nutrients and dietary requirements for therapeutic condition.
- To learn recent concepts in dietary management of different diseases.

UNIT-I : CARBOHYDRATES

History, classification, sources, functions, digestion, absorption, utilization and storage, hormonal regulation of blood glucose, role of carbohydrate in dental caries. Dietary fiber - Development and concept, role of fib rein lipid metabolism, colon function, blood glucose level and GI tract functions - Disadvantages of Dietary fibre.

UNIT-II : LIPIDS

History, classification, sources, functions, digestion, absorption, utilization and storage, effects of deficiency and excess of fat, lipotropic factors, role of saturated fat, cholesterol, lipoprotein and triglycerides and EFA in the diet.

UNIT-III : PROTEINS AND AMINOACIDS

History, classification, sources, functions, digestion, absorption, utilization and storage, protein quality evaluation, nutritional classification of aminoacids, aminoacid balance, imbalance and toxicity, aminoacid pool.

UNIT-IV : ENERGY

History, energy value of foods, SDA, energy production, factors affecting thermogenesis, energy utilization by cells, energy output - BMR, physical activity, factors affecting energy input - hunger, appetite, energy balance, measurement of energy content of food.

UNIT-V : MINERALS & VITAMINS OF NUTRITIOIN VALUE

Definition, classification, sources, bio-chemical functions and deficiencies manifestations.

UNIT-VI

Inter relationship between carbohydrate, fat and protein, nutritional adaptation and hypotheses.

UNIT-VII

Recommended allowances - RDA for Indians, basis for requirement, computation of allowance based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life.

UNIT-VIII

Nutrition in Pregnancy
Stages of gestation, maternal weight gain, complications of pregnancy, maternal physiological adjustments, nutritional problems and dietary management, importance of nutrition during and prior to pregnancy, teenage pregnancy - nutritional problems and dietary management, planning a menu.

UNIT-IX

Nutrition during Lactation
Physiology of lactation, hormonal control and reflex action, efficiency of milk production, problems of breast feeding, nutritional composition of breast milk, nutritional concerns during lactation, special foods during lactation, dietary modification, planning a menu.
Nutrition in Infancy
Infant feeding, nutritional needs, premature infant and their feeding, weaning foods. Feeding Problems, infant formulae lactose intolerance, planning menu. Nutrition in Pre-school - Physiological development related to nutrition, feeding problems, behavioural characteristics, nutritional requirement and planning diet.

UNIT-X

Nutrition in school children - feeding school children and factors to be considered. Planning a menu, feeding problems, packed lunch. Nutrition during Adolescence - changes in growth and evelopment, hormonal influences, Age at menarche - factors affecting age at menarche, psychological problems, body image, disordered eating behaviour, nutritional problems, planning a menu.

UNIT-XI

Nutrition in Adult and Elderly
Nutrition and work efficiency, Menopausal and post menopausal women, hormonal changes, nutritional requirement, planning a menu. Physiological changes in aging - Psycho-social and economical factors affecting eating behaviour, social situation, knowledge and belief, institutionalization, common health problems, nutritional requirement, modification in diet, feeding old people.

UNIT-XII

Principle of Nutritional care, Types of hospital diets.
Nutrition Support Techniques, Eneteral feeding - indications, Types - Nasogastric, Gastrostomy, Jejumostomy and Rectal feeding - requirements and advantages.Parenteral feeding - Nutritional Support, Formula feeds and Complications in TPN.

UNIT-XIII

Diet in Febrile condition
Short duration - Typhoid, Influenza, Malaria, Long duration Tuberculosis.Diet in deficiency diseases - PEM, Vitamin A, Anaemia Surgery - Physiological response, Metabolic Consequences, Stage of Convalescence, pre and post operative diets.Burns - Metabolic changes in protein and electrolytes and Nutritional support. Diet in Energy Imbalance - Underweight and obesity, Etiology and dietary management. Diet in allergy - Common food allergens, test for allergy - Skin test and Elimination diet and Treatment for allergy.

UNIT-XIV

Diseases of cardio vascular system –
Risk factors of CVD, Etiology, Symptoms, and dietary management of atherosclerosis. Ischemic heart disease, dislipidemia, prevention through life style modifications. Hypertension - Classification, prevalence, Diet related factors influencing hypertension , Management of hypertension.

UNIT-XV

Diseases of the Gastro intestinal system- Disorders, Etiology, Symptoms and dietary management of Acute gastritis, Chronic gastritis, Peptic ulcer - duodenal & gastric Intestinal disease - Flatulence, Diarrhoea and Dysentry, Constipation, Celiac disease, Tropical sprue, Irritable bowel syndrome, diverticular disease, colon cancer, Ulcerative colitis. Liver disease - Hepatitis, cirrhosis, Jaundice, fatty liver, cholecystits and cholelithiasis, Hepatic coma. Pancreas - Pancreatitis, Acute and chronic Diabetes Mellitus - Etiology, Types, Symptoms, Diagnosis, metabolic alterations, complications and treatment.

UNIT-XVI

Diseases of the Kidney - Etiology, Symptoms and Dietary modification, Nephritis, Nephrosis, Acute and chronic renal failure, Nephrolilthiasis, Transplantation and dialysis, Dietary Modification. Dietary modification and Nutritional Support for cancer and HIV.

M.Sc. Nutrition & Dietetics

PRACTICAL - MSCND-01 PAPER – I
Nutrients and Diet Therapy

NUTRIENTS

- Ashing of food and preparation of ash solution.
- Estimation of calcium in food.
- Estimation of phosphorus in food.
- Estimation of iron in food.
- Estimation of ascorbic acid in cabbage by dye method.
- Estimation of thiamine in food by fluorimetry.
- Menu planning, Preparation and Presentation for the following
  - Pregnancy
  - Lactation
  - Infants
  - Pre-schoolers
  - School going children
  - Adolescence
  - Adult of different working category
  - Old people
  - Menu of different variation - age specific, income specific and condition specific.
  - Menu of different variation under each:
  - Age category mentioned above
  - Weight (underweight, obesity).
  - Any special condition.
  - Based on type of work.
  - Menu planning for sports persons
  - Menu planning for Mountaineering, sea voyage and space travel
- Types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
- Diet for - obesity, underweight, febrile conditions.
- Diet in gastro intestinal disorders - peptic ulcer, diarrhea, constipation.
- Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
- Diet in kidney disorders - Glomerulo nephritis, nephritic syndrome, renal failure, and urolithiasis.
- Diet in Diabetes mellitus - Insulin dependent diabetic mellitus, non- insulin dependent diabetes mellitus, diabetes with complications.
- Diet in Cardio vascular disease - Hypertension, atherosclerosis, congestive heart failure.
- Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding. Visit to a health club.
- Diet in deficiency diseases - Anaemia, underweight, obesity

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SYLLABUS
MSc Nutrition & Dietetics

MSCND-02 PAPER – II
Advance Food Science and Biotechnology

Objectives

Understand the principles of cooking
Learn the composition of various foods.
Study the effects of cooking on composition
Importance of Biotechnology
To know the applications of Biotechnology in food

UNIT-I

Food Groups
Cereals - Rice & wheat and other Millets - Composition and Nutritive Value. Starch - Sources, Characteristics, Principles of Starch cookery.
Batter and Dough - Structure, Principle, Properties, Different types of flour, Gluten - properties, Gluten formation. Flour - Types, properties. Bread - yeast leavened, Quick bread. pastries, Role of ingredients & preparation cakes - Role of ingredients & preparation.

UNIT-II

Pulses - Composition, types, Cooking methods, factors affecting cooking quality, nutritive value, toxic constituents and its removal, Germination and factors affecting Germination .
Vegetables - Structure, Classification, Composition, Methods of Cooking, Changes on Cooking - pigments, Nutritive value.
Fruits - Structure, Classification, Composition, Ripening of fruits, changes on ripening, Pectin substances, Cooking changes.

UNIT-III

Egg - Structure, Composition, Nutritive value, Grading, Methods of Cooking and Role of egg in cookery.
Meat - Structure, Composition, Nutritive value, Classes and Grades of meat cuts, Changes on cooking and Rigor mortis. Poultry - Composition, Nutritive value, Grades, Methods of cooking, Effects of cooking.
Fish - Composition, Nutritive value, Types, Cuts, Selection, Spoilage, Cooking and Factors effecting cooking quality.

UNIT-IV

Milk and Milk Products - Composition, Nutritive value, Constituents, Properties of milk, Effects of acid, Salt, Heat on milk proteins and coagulation.

Milk products -
Ice cream, Types, Crystal formation and Dairy forms.
Fats & Oils - Types properties of fat relating to cooking, Rancidity, Tests for radcidity, Hydrogenation, Changes in fat during heating, Factors affecting fat absorption, Shortening, Use of fat in tenderness of cooked products.

UNIT-V

Sugar cookery - Types of sugar, Properties, Crystallization, Stages in Sugar cookery, Application in Indian recipes.
Beverages - Classification, Nutritive value, Preparation of milk based beverages.Spices and Condiments - Uses and abuses.

UNIT-VI

Biotechnology - Definition, Scope , Application.
Gene cloning - Definition, Basic concepts, Characteristics of ideal cloning vector, Plasmid, Bacteriophages, Cosmid and Phasmid Eg. PBR 322.

UNIT-VII

Fermentation Technology - Definition, Steps in fermentation, Design of bio reactors, Medium & Micro organism. Microbial products - Primary, secondary metabolites, Vit B12, Citric Acid, Penicillin & alcohol.

UNIT-VIII

Enzyme Technology - Production of enzymes - Amylase, Protease, Lipase, Lactase and pectinase. Use of enzymes in food & beverage industry (eg Cheese, fruit, juice, Wine, Meat tendarizing & dairy)

UNIT-IX

Plant tissue culture - Basic requirement for tissue culture Lab, Media & Techniques (Basics only)Animal cell culture - Primary culture cell line, media requirement & application (only outline)

UNIT-X

Biotechnology & Health care
Vaccines - Types, Biogas & Bio ethanol production, Concept of Bio - remediation, Hazards of genetic engineering.

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SYLLABUS

MSc Nutrition & Dietetics

PRACTICAL - MSCND-02 PAPER – II

Advance Food Science and Biotechnology

1. Cereal cookery - Preparation of rice based products - Idkli, Dosai, Appam to study the effect of fermentation and soaking.
   Preparation of wheat based products - Chappathi, phulkas, poories - with different proportion of wheat flour - study the development of gluten.
2. Pulse cookery - Effects of soaking, acid , alkali and sprouting and different methods of cooking on cooking time and quality of pulses.
3. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.
4. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods, foam formation and factors affecting foam formation. Special effect on colour and tenderness.
5. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils, factors affecting fat absorption. Foods and Nutrition: Syllabus (CBCS)
6. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes. Crystallization and factors affecting crystallization.

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M.Sc. Nutrition & Dietetics

MSCND-03 PAPER – III
Biochemistry, Microbiology and Standards

Objectives

To enable the students to :

understand the need for the study.
learn the various metabolic cycles.
analyze the significance of biochemical findings.
learn about the morphology of different microorganisms.
study the spoilage caused by microorganism
understand the various types of poisoning and infection caused by microorganism.
be aware of fundamental food quality control procedures.
aware of common food standards
know about food laws.

Biochemistry Syllabus

UNIT-I : BIOLOGICAL OXIDATION

Enzymes and co-enzymes involved in oxidation and reduction, respiratory chain, phosphates in biologic oxidation and energy capture, role of respiratory chain and mechanism of phosphorylation.

UNIT-II : METABOLISM Of CARBOHYDRATE

Glycolysis, Gluconeogenesis, TCA cycle, HMP shunt, bioenergetics, disorders of carbohydrate metabolism - galactosemia, glycogen storage disease, pentosuria, abnormal level in blood glucose.

UNIT-III : METABOLISM Of LIPIDS

Biosynthesis and oxidation of saturated and unsaturated fatty acids, glycerides, phospholipids and cholesterol, bioenergetics, disorders of lipid metabolism, lipoproteins and their significance.

UNIT-IV : PROTEIN And AMINOACID METABOLISM

Biosynthesis of protein, general catabolism of aminoacids, deamination, transamination, urea cycle, disorders of aminoacid metabolism - phenyl ketonuria, cystinuria, albinism, alkaptonuria, maple syrup disease.

UNIT-V : METABOLISM OF NUCLEIC ACIDS

Biosynthesis of purine and pyramidine nucleotides, DNA replication and repair, biochemical importance of cyclic AMP. Disorders of purine and pyrimidine metabolism - gout, aciduria,

xanthinuria. Structure and properties of DNA, RNA -mRNA, tRNA, rRNA. Functional tests - Gastric, liver, renal and endocrine.

Microbiology Syllabus

UNIT-VI

Classification of microorganism, morphology of yeast, mould, bacteria, virus, algae and protozoa.

UNIT-VII

General principles underlying spoilage of food, fitness and unfitness of food for consumption, contamination and spoilage of non perishable and perishable foods.

UNIT-VIII

Food in relation to disease - food born diseases, food infection, intoxication, microbial toxins - types, bacterial poisoning and infection - causative agents and sources , symptoms and prevention of Staphylococcal food poisoning, botulism, salmonella, bacillus infection, E.coli, food poisoning of fungal origin - ergotism, aflatoxin.

UNIT-IX

Control of microorganism - Principles of preservation, Preservation by high and low temperature, chemical preservatives, salt, sugar as preservative, new trends in preservation.

UNIT-X

Sterilization by Physical agents - Heat, moist heat, fractional sterilization, pasteurization, other types of sterilization, chemical sterilization. Microbiology of water, typical organisms in water, types of bacterial examination for water, water treatment.

UNIT-XI

Principles of quality control - Raw material process control and Product inspection. Food adulteration and hygiene - definition, Common adulterants in different foods, method of detecting adulterated foods.

UNIT-XII

Food additives - Definitions, Types, Action.Leavening agents - Definitions, Classifications. Colour of foods - Natural colours, certified artificial colours, Non-certified colors, Use and Optimum levels.

UNIT-XIII

Enzymes of importance in food processing - Carbohydrates, Proteases, lipases, oxidoreductases, hydrolases. Standards for foods - Milk and milk products, Fruits and Vegetables, Beverages and Fleshy foods.

UNIT-XIV

Food Laws, Consumerism - Definition, Consumer protection, Consumer Education, Legal modes of protection and Machinery for redressal of consumer grievances.

UNIT-XV : EVALUATION OF QUALITY OF FOODS

Sensory Evaluation of foods - Requirement for conducting sensory tests, Types of test, limitation of sensory evaluation. Objective methods of evaluation of food. Improvised instruments used for Indian recipes.

M.Sc. Nutrition & Dieteties

PRACTICAL - MSCND-03 PAPER – III

Biochemistry, Microbiology and Standards

Biochemistry (Practicals)

1 Estimation of Serum cholesterol
2 Estimation of Blood glucose
3 Estimation of Serum proteins
4 Estimation of Albumin / Globulin ratio.
5 Estimation of Serum creatinine
6 Estimation of Uric Acid
7 Estimation of Calcium and Phosphorous
8 Analysis of Abnormal Urine

Microbiology (Practicals)

1 Identification of microorganism - Yeast, mould, algae.
2 Simple staining, grams staining and hanging drop preparation.
3 Identification of microorganisms in curd.
4 Identification of mould in bread.
5 Bacteriological testing of milk.
6 Observation of culture characteristics and preparation of culture media.
7 Preservation using low temperature, high temperature and chemical preservatives.

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M.Sc. Nutrition & Dietetics

MSCND-04 PAPER – IV
Research Methodology and Recent Advances

Objectives

To enable the students to :

understand the importance of Research.
learn about the various applications of statistics in the research.
familiarize on writing the project report.

UNIT-I

Meaning of research, Types of research, Objectives of research. Collection of Data - Methods of collecting data. Primary and Secondary data - Sources of Primary and Secondary data, Editing the data and precautions used in the use of data. Different types of research tools for collecting research data, defining and determining a problem.

UNIT-II

Sampling Design - Census and sampling survey, Methods of sampling - Probability and non-probability sampling methods size of the sample, Merits & Demerits of each sampling method, Sampling errors and methods of Reducing the error.

UNIT-III

Classification and Tabulation of Data - Meaning, Objective, Types of Classification, Formation of frequency distribution, Tabulation of data - Schemes general rules, Types of tables and preparation of tabular forms. Representation of data - Diagramatic and Graphic significance, Types of diagrams, Types of graphs.

UNIT-IV

Measures of central tendency - Mean, Median, Mode, their relative advantages and disadvantages. Measures of dispersion - mean deviation, standard deviation, Quartile deviation, Co-efficient of variation, percentile, Association of attributes, Contingency table, correlation - coefficient of correlation and its interpretation, Rank correlation, Regression equation and predictions.

UNIT-V

Probability - Theorems, Simple Problems, Distributions - Binomial Poisson distribution, normal distribution, their properties and simple problems. Testing of significance - Large and Small sample tests - 't' test, Chi square test, and 'F' test - simple problems. Writing a research report - format of thesis writing with eg.

PRACTICAL - MSCND-04 PAPER – IV
Research Methodology and Recent Advances

1. Collection of Primary and Secondary data
   - i. Direct personal Interview - schedule
   - ii. Drafting questionnaire
   - iii. Pilot study for validating
2. Sampling Techniques
   - i. Judgement Sampling
   - ii. Quota Sampling
   - iii. Convenience Sampling
   - iv. Random Sampling
   - v. Stratified Sampling
3. Classification of data
4. Formation of frequency distribution
5. Tabulation of data - Types of Tables (eg)
6. Diagrammatic Representation of data
   - i. Graphs - Different types
   - ii. Bar diagrammes
   - iii. Pie diagram
   - iv. Histogram
7. Calculation of Mean, Median, Mode and SD
8. Correlation Analysis
9. 't' test and chi-square test

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Subject: Copy of paras of the Minutes of the 45th meeting of the Board of Management held on 14.10.2016 at 02:30 pm in the Committee Room, State Institute of Health & Family Welfare Complex, SAS Nagar (Mohali)

14. Considered the recommendations of the Academic Council made in its 25th meeting held on 30.08.2016 vide para-15 and after some discussion it was **RESOLVED**: To approve that Guide: Student Ratio for PG Paramedical Courses i.e. M.Sc./ Master in Hospital & Healthcare Administration (MHHA), etc. will be 1:3 under the Faculty of Medical Sciences. It was informed by Vice-Chancellor that the recommendations are within the prerogative of the University and no approval is required from the Central Council/body(s).