

GOVT. BILASA GIRLS' P.G. (Auto.) COLLEGE

Link Road, Bilaspur (C.G.)

Phone No. : 07752-224249, Website : www.bilasagrilscollege.ac.in



SYLLABUS

M.Sc. Food & Nutrition
Semester - I & II

2021-22



DEPARTMENT OF FOOD & NUTRITION

**"Regulation for Examination (Semester System)
At Post Graduate Level, Under Autonomous Scheme"
Session : 2021-22**

Bilaspur Universtiy, Bilaspur (C.G.) vide letter No. 277/Bub/Acad/2012dated 12/9/2012 has granted affiliation to the Govt. Girls' P.G. College, Bilaspur (C.G.) Further the University Grants Commission, New Delhi vide letter No. F-22.01.2005 (Desk-AC) December 2005 and Guru Ghasidas University, Bilaspur (C.G.) vide letter No. 81/CDC/Auto/2006 dated 22.05.2006 have extended the autonomous Govt. Girls' P.G. College upto 2011 which has been again extended till the session 2016-17 vide letter No. UGC F-22-1/2011 AC January 2012 and now UGC conferred Autonomy upto 2023. The University has authorized Govt. Girls' P.G. College, Bilaspur (C.G.) to frame syllabus and conduct examination in the following faculties the subjects at the Post Graduate level.

FACULTY

SUBJECT

I. Arts

- | | |
|-------------------|---------------------------|
| 1. M.A. Economics | 2. M.A. English |
| 3. M.A. Geography | 4. M.A. Hindi |
| 5. M.A. History | 6. M.A. Political Science |
| 7. M.A. Sociology | 8. M.A. Urdu. |
| | 9. M.A. Psychology |

II. Science Faculty

1. M.Sc. Botany
2. M.Sc. Chemistry
3. M.Sc. Food & Nutrition
4. M.Sc. Human Deveipment
5. M.Sc. Mathematics
6. M.Sc. Physics
7. M.Sc. Zoology
8. P.G. Diploma in Computer Science.

III. Commerce

1. M.Com.

IV. BJLib. I.Sc.

1. As per the decision taken by the Co-ordination Committee in its Eleventh meeting, and in compliance of the order issued by the Directorate of Higher Education, vide letter No. 341/187/CHE/Co-ord/06 dated 27.04.2006 Govt. Girls' P.G. College Bilaspur (C.G.) is semester system of examination from the session 2007 at post Graduate Level.
2. The course, of siudy at the post Graduate Level (Master of Science, Master of Arts and Master of Commerce) is extended over four semesters in two academic Sessions. Examination of the first & Second semesters will be held in the first academic session and the third and fourth semesters in the second academic session.
3. Practical Examination of the science Faculty / Subjects will be held with the theory examination in each semester, where as Viva-Voce Examination of Arts and Commerce Faculty will be held with the theory examination of second and fourth semester.

ADMISSION:

4. The admission in the Post Graduate Classes shall be strictly on merit basis in accordance to the admission rules of Govt. of Chhattisgarh State.
5. A graduate from any recognized University of Chhattisgarh State is eligible for admission in the Post Graduate Classes. A graduate from any recognized University outside of the Chhattisgarh state will also be eligible for admission in the Post Graduate Classes provided, she fulfills all other conditions of eligibility.

SYLLABUS:

6. Each course shall be framed and approved by the Board of studies of that subject and Academic Council of the college.
7. There shall be four or five theory papers in each subjects in each semester Practical examination of the subjects shall be conducted as per the syllabus framed and approved by the Board of Studies of that subject.
8. A student who has 60% or more aggregate marks in three semester can opt Dissertation as an Optional Paper in the forth semester if there is such a provision in the course of that subject.
9. In the theory papers of semester examination, there shall be 80 marks for external examination and 20 marks for internal examination. Each theory paper of the semester examination shall be of 80 marks in which there shall be ten questions in total out of which a candidate will have to attempt five questions Maximum marks of the practical decided by the board of studies of the subject.

EXAMINATION PATTERN :-

10. There shall be main examination at the end of the each semester First and Third semester examination shall be held as for a possible in the month of November and second & fourth semester examination shall be held as for as possible in the month of April.
11. To be successful in the exam a student has to score at least 20% marks in each Internal & External theory papers with an aggregate of 36% marks. Also to be successful in each practical paper a student has to score 36 marks. Best marks of the two internal text examination will be incorporated in the marks of semester examination. The head of the department shall submit the detailed mark list to the controller of Examination after the completion of all tests and seminars.
12. A student declared fail in one or two papers in the semester examination can appear in the second attempt examination in the same paper which will be held after two months of the main semester examination but if a student declared failed in more than two papers of semester examination will have to appear in all the four or five papers in the second attempt examination.
13. If a student is absent in all the papers of the main semester examination then she will be ineligible to appear in the second attempt examination, but if a student appears in some papers and fail to appear in the remaining papers of the main semester examination then she will have to submit an application giving reason to . the principal / Controller with sufficient

proofs. On the basis of proofs a High level committee will decide upon the matter. High level committee will have power to allow the student to appear in the second attempt examination.

14. A student who fails in a semester examination shall be eligible to take admission in the course of study of next semester but she shall not be eligible to appear in the next semester examination unless has passed all the remaining papers of the previous semester in the second attempt examination.
15. The admission of the student who fails in the second attempt examination of a semester, the admission to the next semester will automatically be cancelled and she will have to appear in all the papers of the semester examination in the next academic session as an Ex-student but marks of the internal examination will carry forward.
16. It is a must for the students to appear in the Internal test on the scheduled dates which will be declared by examination cell failing to which she shall be declared fail. If due to some unavoidable circumstances and sufficient reason the students fails to appear in the test on scheduled dates they have to appear before the High level Committee comprising of the Principal, Controller of Exam and Head of the Department of the particular subject with sufficient proof. The high level committee will decide the matter based on the proofs submitted by the students.
17. If a student leaves the college after taking admission in a course of study of semester without appearing in Internal & External examination and if she would like to take admission in any forthcoming academic session in the same semester she shall be given admission in the same session as a regular student but her status will be of Ex-student,
18. For Diploma courses there shall be annual examination pattern in which only external examination and practical examination will be held. There shall be no internal examination and seminars for these courses. Syllabus of these courses shall be framed by the board of studies, of the particular subject.
19. For B.Lib. I.Sc. course there shall be Annual Examination pattern and Internal tests & seminars will be organized.

Marks Scheme/Pattern of Question-

According to decision taken by the academic council of the college the pattern and marks scheme of question paper for P.G. as follows –

Type of Question	Q. to be set From each unit/Content	Q. to be solved	Marks Assigned	Total Marks
Objective / In few words	10	06	02	12
Short Answer Type Questions	07	04	05	20
Long/Essay type of question	07	04	12	48
			TOTAL	80

DIVISION AWARD

20. If a student is absent in all the papers of the main semester examination then she will be ineligible to appear in the second attempt examination, but if a student appears in some papers and fail to appear in the remaining papers of the main semester examination then she will have to submit an application giving reason to the principal / Controller with sufficient proofs. On the basis of proofs a High level committee will decide upon the matter. High level committee will have power to allow the student to appear in the second attempt examination.
21. The division shall be awarded at the end of the Fourth Semester on the basis of taking together the aggregate of marks obtained by the students in all the four semester examination. The division shall be awarded on the following basis –
 1. I Division - 60% & above
 2. II Division - 48% & above but less than 60%
 3. III Division - 36% & above but less than 48%
22. A candidate who fails by one mark in a paper or in aggregate, shall be given grace mark but this one mark shall nowhere be added. Such candidate shall be declared pass with grace.
23. A candidate who lacks one mark to attain division shall be given one grace marks.
24. The names of first five candidates who have obtained first division at the end of the fourth Semester will be declared in the order of merit.

REVALUATION :-

25. A candidate can apply for revaluation of answer books in not more than two theory papers: She has to pay prescribed fee for each paper within 15 days after the publication of the result of the semester examination. The provision of revaluation is only for the main exam and there is provision of revaluation for the second attempt examination.
26. The change in the marks will depend upon the rules of revaluation issued by the Bilaspur University, Bilaspur from time to time.
27. The points, which are not covered in the regulation mentioned above shall be governed by the existing rules, regulation and ordinance of Bilaspur University, Bilaspur (C.G.)

1st SEMESTER
MSc-Foods & Nutrition

MARKING SCHEME

Sr No	Name of Papers	Theory	Internal Assessment	Seminar	Total
1	Applied Human Physiology	80	10	10	100
2	Food Science	80	10	10	100
3	Clinical & Therapeutic Nutrition	80	10	10	100
4	Research Methods & Scientific writing	80	10	10	100

Practical

Sr No	Name of Practical	Marks
1	Physiology	100
2	Food Science	100

Total Marks = 600

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PAPER - I
SEMESTER-I
Applied Human Physiology

Total Marks-80

1. Cell Structure and Tissues:

Structure of a human cell.-Organelles and Inclusions, Elementary study of tissues of the human body- Epithelial, Osseous tissue, connective, Muscular, Nervous (Neuron).special cells and tissues

2. Endocrine System :

Endocrine glands- structure, regulation of hormonal secretions- Thyroid, Parathyroid, Pancreas, Pituitary, Adrenal, Sex glands.

Disorders of endocrine glands.- Hypo and Hyper Thyroidism, Diabetes Mellitus,, Hyperinsulaenemias, sex hormones related problems, Acromegaly, Acromicria, Gigantism, Dwarfism, Cretinism and other pituitary disorders.

3. Respiratory System :

Structure, functions of organs of Respiratory tract. Exchange of gases. Mechanism of Respiration, Transport of Oxygen and CO₂.Nervous and chemical Regulation of Respiration, Asphyxia, hypoxia.

4. Digestive System :

Structure, function of organs of Gastro- intestinal tract, Liver, Pancreas, Gallbladder. Process of digestion and absorption.

5. Muscular System :

Muscles - Types, structure, functions, Changes during muscular Contraction.

6. Excretory System :

Structure and function of nephron, kidneys, Urinary bladder Urine formation. Composition of urine. Micturition process , role of spinal cord. Maintenance of acid base balance.



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SEMESTER-I
Paper II
FOOD SCIENCE

Total Marks - 80

1. Introduction to food Science -

Evolution of the food industry and Allied industries Development of food science as a discipline.

2. Polysaccharides, Sugar and Sweeteners-

Starch: Structure, composition gelatinization. Methods for gelatinization. Changes. Characteristics of some food starches. Effects of ingredients and conditions on gelatinization. Modified food starches.

Sugars and sweeteners- sugar syrups, sugar products Structural relationships to sweetness and crystallization.

3. Cereals and Cereal Products-

Cereal grains - structure and composition, Cereal products, flour and flour quality, Extruded foods. Wheat germ, Bulgur, puffed and flaked cereals.

4. Fats, Oils and Related Products-

Sources. Composition effect of composition on fat properties. Functional properties of fat and uses in food preparation. Fat substitutes. Fat deterioration and antioxidants.

5. Milk and milk products

Composition, physical and functional properties

Dairy products- cultured milk, Yogurt, butter, whey, cheese. Frozen desserts dairy products substitutes.

6. Eggs -

Structure and composition. Changes during storage. Functional properties. Egg use in cookery Egg processing.

7. Fruits and vegetables - composition.. Enzymes in fruits and vegetables. Plant Pigments.. Texture of Fruit and vegetables. Effects of storage processing and preservation.

8. Leavened Products : Leavening agents. Biologically leavened and chemically leavened products. Batters and dough.

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SEMESTER - I
Paper - III
Clinical & Therapeutic Nutrition

Total Marks = 80

1. **Nutritional Screening and assessment of nutritional status of Hospitalized and outdoor Patient.** Identification of high risk Patients Assessment of Patient needs based on interpretation of Patient data- clinical, biochemical, biophysical, Personal etc.
2. **Diet nutrient and drug interaction.** Effect of drugs on ingestion, digestion absorption and Metabolism of nutrients. Effect of Food, nutrients and nutritional status on drug dosage and efficacy.
3. **Etio-pathology-** physiology, metabolic and clinical aberrations-complications, prevention and recent advances in the medical nutritional management of-
 - [a] **Cardio-vascular disorders-**
 - 1] Hyperlipidemiass-classification and nutritional care
 - 2] Atherosclerosis- etiological factors, pathogenesis, dietetic management
 - 3] Hypertension-classification, etiology, nutritional care
 - 4] Rheumatic heart disease
 - 5] Ischemic heart disease
 - 6] Myocardial Infraction
 - [b] **Endocrine Disorders-**
 - 1] Diabetic Mellitus-
 - I] Symptoms, Types, Diagnosis
 - II] Metabolism in Diabetes
 - III] Dietary management and meal management
 - IV] Insulin Types
 - V] Complications
 - 2] Additions Disease
 - 3] Hyperinsulinemias
 - 4] Hyperthyroidism
 - [c] **Gastro- intestinal tract Disorders**
 - i) Gastritis- Types and Dietary modifications
 - ii) Peptic Ulcer-Etiology, Symptoms, Dietary Modifications, intervals of feeding, bland Diet
 - iii) Sprue- Types and dietary considerations
 - iv) Indigestion
 - v) Diarrhea- classification and modification of diet
 - vi) Constipation- classification and dietary considerations
 - vii) Celiac diseases

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[d] **Liver and gall bladder, Pancreatic disorder**

- i) Jaundice- classification and dietary treatments
- ii) Hepatitis- Types and dietary management
- iii) Cirrhosis- Types and dietary management
- iv) Gallstones- -types and complications.

[e] **Renal Disorders- Basic renal functions, classification of renal diseases**

- i) Nephritis-symptoms and nutritional care
- ii) Nephrosis-types and dietary management
- iii) Kidney stones- types and dietary management
- iv) Renal Failure (Acute & chronic)

[f] **Weight Imbalances- Regulation of Energy Metabolism**

- i) Obesity-
 - (a) types, Etiology, treatment, diet and other measures
 - (b) Complications of Obesity
- ii) Under Weightiness- Causes and Dietetic Management

References

1. Human Nutrition & Dietetics - Davidson & Passmore
2. Clinical Dietetics & Nutrition - F.P. Antis
3. Textbook of Normal & - Robinson
4. Nutrition in Health & Diseases - Babar C. Mitchell
5. Food Nutrition & Diet Therapy - Krause
6. Clinical Nutrition - Jelliffe.

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SEMESTER-I
PAPER - IV
RESEARCH METHODS & SCIENTIFIC WRITING

Total Marks-80

Note :- Attempt five question Two questions from each section is compulsory.

SECTION - A

1. Science, scientific methods, scientific approach.
2. Role of statistics and research in Home Science discipline.
Objectives of research: Explanation, control and prediction.
3. Types of Research-Historical, Survey, Experimental, Case-Study, Social Research, Participative Research.
4. Definition and Identification of Research Problems
 - Selection of Research Problem
 - Justification
 - Theory, Hypothesis, Basic Assumptions, Limitations and delimitations of the problem.
5. Types of Variables.
6. Theory of Probability
 - Population and Sample
 - Probability Sampling: Systematic, random Sampling Two Stage and multi stage sampling, cluster sampling.
 - Non-Probability Sampling: Purposive, quota and volunteer sampling/snow ball sampling.

SECTION - B

7. Basic Principles of Research Design-
 - Purpose of research design: Fundamental, applied and action exploratory and descriptive, survey and case study, ex-post facto.
 - Longitudinal and cross sectional.
8. Conceptual understanding of statistical measures, Classification and tabulation of data. Measurement of central tendency, measures of variation.
9. Frequency distribution, histogram, frequency, polygons, Oliver.
10. Binomial distribution

References

1. Garrett, Henry E (1971). Statistics in Psychology and Educatio. Devid Heley and Co.
2. Edwards. Experimental Design and Psychological Resear5ch.
3. Kerlinger : Foundation of Education Research.
4. SPSS/PC for the IBV PC/XT, SPSS Inc.

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SEMESTER-I
PRACTICAL-I
HUMAN PHYSIOLOGY

Total Marks- 100

1. Detection of permanent slides of various body organs.
2. Differential WBC Counting by using diluting fluid.
3. Differential RBC Counting by using diluting fluid.
4. Measurement of blood pressure by auscultatory methods.
5. Determination of erythrocyte sedimentation rate [ESR].
6. Determination of osmotic resistance of RBCs.
7. Effects of high temperature, salt and acid addition on Ptyalin present in saliva.
8. Estimation of titrable in gastric juice.
9. Determination of bleeding and clotting time.
10. Preparation of Haemin crystals.
11. Determination of hemoglobin.
12. Identification of blood group and Rh factor.

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SEMESTER - I
PRACTICAL - II
FOOD SCIENCE

Total Marks-100

1. Effect of solutes on boiling point and freezing point of water.
2. Effect of types of water on characteristics of cooked vegetables, pulses and cereals.
3. Sugar and jaggery cookery: Relative sweetness, solubility and sizes of sugar, stages of sugar cookery, caramalization, and crystallization factors affecting crystal formation.
4. Starches and cereals: Gluten formation and factors affecting gluten formation.
5. jam and jellies Pectin content of fruits role of fats and oils in cooking as shortening agent frying medium factors affecting fat absorption, fat crystals, plasticity of fats, Permanent and semi permanent emulsions.
6. Milk and milk products: Effect of acid salt, alkali sugar, heat
7. Egg, structure assessing egg quality. Use of egg in cookery Emulsions air incorporation, thickening, binding gelling. Method of egg cookery and effect of eat. Egg white foams and factors affecting foams.
8. Pulses: Effect of various cooking and processing methods on various characteristics, functional properties of pulses and their products.
9. Meat and poultry: Methods affecting tenderness of meat effect of various methods of cooking and ingredients on colour, volume, texture, flavor aroma and water holding capacity.
10. Fish and seafood. Effect of different cooking methods on various fish and seafood.
11. Gelatin, gel strength and factors affecting gelation process. Ability to foam.
12. Fruits and vegetables Pigment -effects cooking imitations, pH Effect of various cooking processes on different characteristics of vegetables. Prevention of enzymatic browning.
13. Leavened Products: Fermentation use of micro organism (Lactic acid yeast) steam as an agent, eggs as an agent, Chemical agent.
14. Beverages: Factors affecting quality of beverages.

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2nd semester
MSc - Foods & Nutrition

MARKING SCHEME

Sr No	Name of Papers	Theory	Internal Assessment	Seminar	Total
1	Geriatric Nutrition & Applied life Sciences	80	10	10	100
2	Food Chemistry	80	10	10	100
3	Problems in Human nutrition	80	10	10	100
4	Statistics & Computer Application	80	10	10	100

Practical

Sr No	Name of Practical	Marks
1	Clinical, Therapeutic & Geriatric Nutrition	100
2	Statistics & Computer Application	100

Total Marks = 600

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SEMESTER - 2nd Semester**PAPER-I****Geriatric Nutrition & Applied Life Sciences****Total Marks-80****1. Nervous System :**

Conduction of nerve impulse, synapses, Role of transmitters. Organization of central nervous system. Structure and functions of Brain, Spinal cord, Hypothalamus- role in various body function. Cerebro-spinal fluid.

2. Sense Organs :

Review of Structure and function. Role of Skin, Eye, Ear, Nose and Tongue in perception of stimuli.

3. Blood & Lymph:

Functions, Composition - Plasma - formation and functions of plasma proteins, Red blood corpuscles, white blood corpuscles, Hemoglobin, Platelets, Blood groups, Clotting of blood. Blood Volume. **Tissue Fluid & Lymph.**

4. Circulatory System :

Heart - Structure, functions. Cardiac cycle, Heartbeat & Sound cardiac output, ECG
Blood vessels - Structure, functions. Blood- pressure., Measurement and adjustment of BP. **Properties of Cardiac Muscle.**

5. Reproductive System :

Structure and functions of Male & female reproductive organs Ovarian, uterine cycles, spermatogenesis, pregnancy, lactation. Parturition. Role of hormones.

6. The ageing Process :Metabolism during aging. Tissue level changes.**8. Nutritional requirement of elderly and dietary management to meet nutritional needs.****9. Chronic degenerative diseases and nutritional problems of the elderly-**

Their Etiopathogenesis , management, prevention and control.- Gout, Arthritis, Parkinson's disease. Alzheimer's Disease., Osteo-dystrophy.

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SEMESTER - 2nd SemesterPaper-II

FOOD CHEMISTRY

Total Marks- 80

1. **Palatability of food and the measurement of its acceptance-** Sensory testing Appearance, smell, taste etc. Objective testing volume tenderness tension. Viscosity, weight, moisture loss etc.
2. **Browning Reaction - enzymatic and non-enzymatic-** Gel structure, formation, strength types . Emulsion - formation, stability and emulsifiers, Foams structure formation and stabilization.
3. **Meat and Poultry-**
Muscle- composition, characteristics and structure, post mortem changes, processing, preservation and their effects. Heat induced changes in meat. Variables in meat preparation, Meat products.
4. **Fish and sea food:** Types and composition storage and changes during storage changes during processing, By products and newer products.
5. **Pulses and Legumes:** Structure, composition, processing, Toxic constituents.
6. **Nuts and Oilseeds-** Composition, oil extraction and by products.
7. **Spices and condiments-** Composition, flavoring extracts, natural and synthetic.
8. **Processed Foods-** Jam, Jellies, Squashes, Pickles.
9. **Beverages-** Synthetic and natural, alcoholic and non-alcoholic, carbonated and Non carbonated coffee, tea, cocoa, confectioneries and chocolate products, baking products dehydrated products.
10. **Traditional Processed Products: fermented foods-** cereal based, pulse- based, fruit vegetable based,- vinegar, pickles.
11. **Salt and Substitutes**

References

1. Food-Selection & Preparation - Sweetman

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2. Foods- their Selection & Preparation - Stanley & Clive
 3. Experimental Foods - Griswald.
 4. Food Chemistry - Meyer
 5. Foundations of Food Preparation - Peackman.
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SEMESTER - 2nd Semester

Paper-III

Problems In Human Nutrition

Total Marks-80

1. Newer trends in delivery of nutritional care and dietary counseling.
2. Cancer - Types of cancer, nutritional effects of cancer, disorders related to treatments, Diet in cancer.
3. Neurological disorder and Stress
(i) Lathyrism (ii) Allergy (iii) Migraine
4. Musculo- skeletal disorder- Arthritis- Nutritional Care
Gout Characteristics and Nutritional Care & other muscular diseases.
5. Infections and AIDS- (i) Typhoid
(ii) Tuberculosis
(iii) AIDS
6. Respiratory Problems-
(i) Asthma
(ii) Cough & Cold
(iii) Emphysema
7. Childhood Problems/disorders including inborn errors of metabolism and their nutritional management..
8. Historical background, Prevalence, etiology biochemical and clinical Manifestations, Preventive and therapeutic Measures for the Following.
(i) PEM
(ii) Vitamin A deficiency
(iii) Nutritional anemia's
(iv) Rickets, Osteomalacia and Osteoporosis
(v) Fluorosis.

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SEMESTER - 2nd Semester
PAPER-IV
STATISTICS & COMPUTER APPLICATION

Total Marks- 100

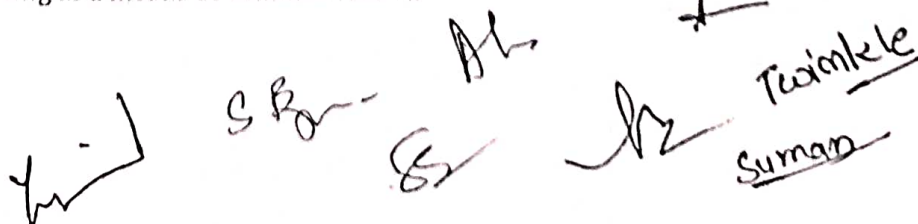
Note :- Attempt five question Two questions from each section is compulsory.

SECTION - A

1. Normal distribution- Use of normal probability tables
2. Parametric and non-parametric tests.
3. Testing of hypothesis. Type I, Type II, errors, Levels of significance.
 1. Chi-square test. Goodness of fit. Independence of attributes 2x2 and rxc contingency tables.
 2. Application of student 't' test for small samples. Difference in proportion for means and difference in means.
4. Correlations, coefficient of correlation, rank correlation.
5. Regression and prediction.
6. Analysis of variance- one-way and two-way classification.
7. Experimental Designs
 - Completely Fundamental design
 - Randomized block design
 - Latin square design
 - Trend Analysis

SECTION - B

8. Quantative Research methods
 - Theory and design in quantative research
 - Definition and types of quantative research
 - Methods and techniques of data collections
 - [1] Informal group discussion
 - [2] Interviews: Key information, in-depth interviews
 - [3] Observations
 - [4] Social mapping
 - [5] Participatory rapid assessment
 - [6] Participatory Learning assessment
9. Data Gathering Instruments- Observation, Questionnaire, Interview, Scaling methods, case study, home visit, reliability and validity of measuring instruments.
10. Scales of measurement and the appropriate statistical techniques.
11. Critical analysis of research.
12. Writing a research proposal.
13. Analysis of data and research reports.
14.
 1. Scientific writing as a means of communication



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- Different forms of scientific writing.
 - Articles in journals, Research notes and reports, Review articles, Monographs,
 - Dissertations, Bibliographies, Book chapters and articles..
 - 2. How to formulate outlines
 - The reasons for preparing outlines:
 - * As a guide for plan of writing
 - * As skeleton for the manuscript
 - Kinds of outline
 - * Topic outlines
 - * Conceptual outline
 - * Sentence outlines
 - * Combination of topic and sentence outlines
 - 3. Drafting titles, Sub titles, tables, illustrations
 - Tables as systematic means of presenting data in rows and columns and lucid way of indicating relationships and results.
 - Formatting tables: Title, Body stab, Stab Column, Column Head, Spanner head, Box Head
 - Appendices: use and guidelines
1. The writing process- Getting started
Use outline as a starting device.

References

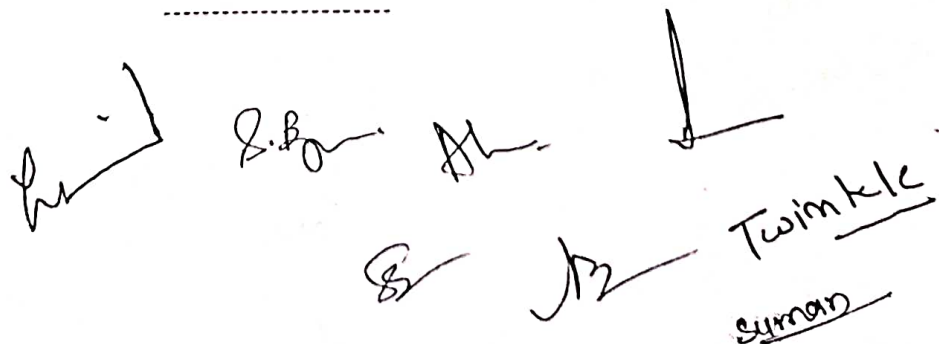
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2. Bhatnagar, G.L. (1990): Research Methods and Measurements in Behavioural and Social, Agri. Cole Publishing Academy, New Delhi.
3. Dooley, D. (1995): Strategies for Interpreting Qualitative Data; Sage Publications, California.
4. Gay, L.R. (1981, 2nd Ed): Educational Research, Charles, E. merill, Columbus, Ohio.
5. Long, J.S. (Ed) (1989); Common Proper Solution Avoiding Errors in Quantitative Research, Beverly Hills, Sage Publications, m California.
6. Mukherjee, R. (1989): The Quality of Life: Valuation in Social Research, Sage Publications New Delhi.
7. Stranss, A. and Corbin, J. (1990): Basis of Qualitative Research : Grounded Theory Procedures and Techniques, Sage Publications, California.
8. Garrett, Henry E (1971). Statistics in Psychology and Educational.
9. Edwards. Experimental Design as Psychological Research.
10. Kerlinger : Foundation of Education Research.
11. SPSS/PC for the IBM PC/XT, SPSS Inc.

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SEMESTER - 2nd**PRACTICAL - II****CLINICAL, THERAPEUTIC & GERIATRIC NUTRITION****Total Marks-100**

- [A] Planning & preparation of Diets for patients with common multiple disorders-
- [1] Weight Imbalances.-Over-weight. Obesity, Under-Weight
 - [2] Cardio-Vascular Disorders-
 - i) Arteriosclerosis
 - ii) Hypertension
 - [3] Endocrine Disorders- Diabetes Mellitus
 - [4] Gastro-Intestinal Tract Disorders-
 - i) Gastritis
 - ii) Gastric and Duodenal Ulcer
 - iii) Sprue
 - iv) Indigestion
 - v) Diarrhea
 - vi) Constipation
 - [5] Liver and Gall Bladder Disorders-
 - i) Jaundice
 - ii) Hepatitis
 - iii) Cirrhosis
 - [6] Renal Disorders-
 - i) Nephritis
 - ii) Nephrosis
 - iii) Kidney Stones
 - iv) Renal Failure
 - [7] Fevers & Infections-
 - i) Typhoid
 - ii) Tuberculosis
- [B] Planning & preparation of diets for the elderly. in health and sickness.
- [C] Visit to old age homes & dietetic departments of hospitals.
- [D] Case Studies



 A collection of handwritten signatures and names, including 'S. B.', 'A.', 'Twinkle', and 'Suman', with some lines and arrows indicating connections or groupings.

BSc (Home Science)
SEMESTER III

MARKING SCHEME

Sr No	Name of the Paper	Theory	Internal Assessment	Total
1	English Language	60	15	75
2	Food Preservation	60	15	75
3	Family Resource Management	60	15	75
4	Community Development Perspectives & Approaches -socio economic analysis of Communities/FQ/FD	60	15	75

Practical-

Sr No	Name of Practical	Marks
1	Food Preservation	50
2	Family Resource Management	50
3	Community Development Perspectives & Approaches -socio economic analysis of Communities	50

TOTAL MARKS= 450

S. J. P. / B. / @ / An / suman / Twinkle

SEMESTER - 2nd Semester

PRACTICAL - II

STATISTICS & COMPUTER APPLICATION

Total Marks - 100

1. Introduction of Computer - Hardware & Software, Opening & Formatting Documents.
2. Running Multiple Programms- Accessories, C.D. Writing, Paints & Brush, Scanning, Zipping of File, Creating Shortcut.
3. M.S. Word-Typing, Fonts-types & Size, Auto Text, Auto Correct, Word Art and Table Creation and operation.
4. M.S. Excel- Data Finding and Statistical Calculation- S.D., Mean, Median, Mode, Average, Sum., Anova, 't' Value, Correlation.
5. Graphical Presentation of Data- Custom, Plain Type.
6. M.S. Power Point- Making of Slides, Show with Different Slide Lay Out, Colour Scheme, Mode of Presentation.
7. Inter Net-Hard-Ware Required Soft-Ware Required, Different Search Engiens.
8. Searching of Documents & Pictures and References, Researching, Saving of PDF File. Conversion of PDF in to HTML File.

P. B. S. A. T. Winkle
S. J. Sumad

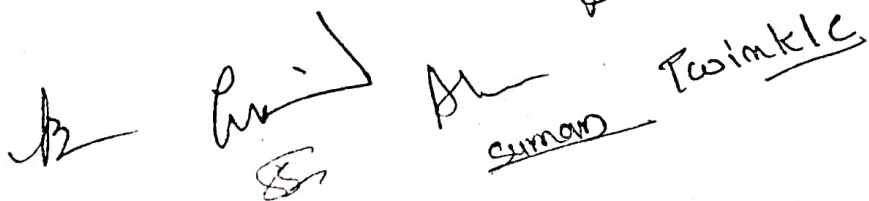
**M.Sc. (3RD Semester)
Food & Nutrition**

MARKING SCHEMES

Serial	Name of the Paper	Theory	Internal Assessment	Seminar	Total Marks
1	Methods of Biochemical Investigations	80	10	10	100
2	Principles of Nutrition	80	10	10	100
3	Institutional Food Administration	80	10	10	100
4	Advanced Nutrition	80	10	10	100

PRACTICALS

1. Methods of Biochemical Investigation	100
2. Institutional Food Administration & New Trends in Nutrition	100
Total Marks =600	



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PAPER I
Semester - III
ADVANCED NUTRITIONAL BIOCHEMISTRY
Total Marks - 80

1. Carbohydrates-

Definition classification, Structure and Properties Monosaccharide's, Disaccharides, Polysaccharides-Glycosides, Tannins, Chitin, Heparin, Glycoprotein's. Muco Polysaccharides. Metabolism- Glycolysis Gluconeogenesis, Citric acid cycle, HMS, GYlycogenesis, Glycogenolysis.

2. Lipids- Definition, Classification, Structure, importance and Properties.

Triglycerides, Phospholipids (Lecithin, Cephahin, Sphyngomyelin), Cholesterol, Glycolipids (Cerebrosides Gangliosides), Bile acids.

Metabolism- Beta-oxidation, synthesis and Breakdown of fatty acids, Triglycerides, Phospholipids, Cholesterol.

3. Protein- Definition, classification. Different theories of Protein structure,

Properties. Plasma Proteins- Nature, Properties & function. Protein Biosynthesis.

Amino Acids- Structure, classification, Properties. Role of RNA & DNA in protein synthesis.

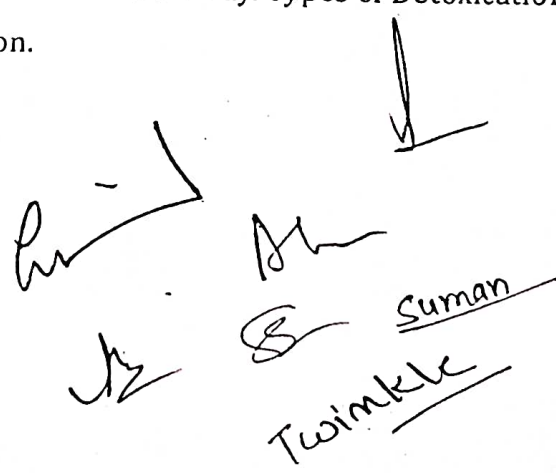
Metabolism- Deamination, Transamination, Decarboxylation, Transmethylation, Krebs's henseleit's Urea cycle.

4. Nucleic Acids- Definition, Structure, Properties of RNA, DNA, Replication,

Transcription. Purines & Pyrimidines- Synthesis and Breakdown.

5. Detoxication- Metabolism of foreign compounds in the body. Types of Detoxication

Oxidative, Reductive, Hydrolysis, Conjugation.



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Semester - III**PAPER -II****PRINCIPLES OF NUTRITION****Total Marks - 80**

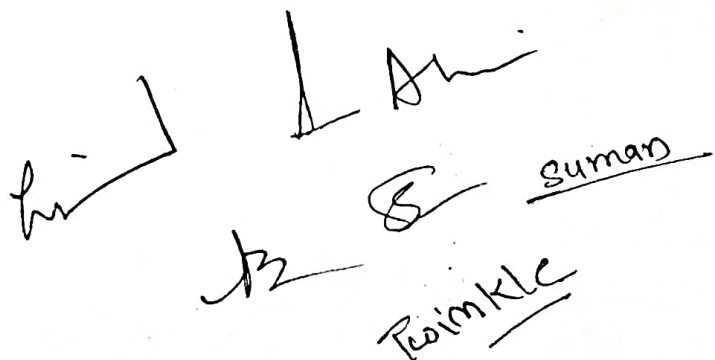
1. **Water:** Regulation of intra and extra cellular volume. Water balance and its regulation.
2. **Body Composition**
 1. Concept of body composition
 2. Biochemical composition of body
 3. Methods of measuring composition
 4. Application of body composition data.
3. **Growth and Development**
 1. Growth and hormones.
 2. Growth and nutrients.
4. **The nutrient content in food**
 1. Food analysis Chemical composition
 2. Food composition Table
 3. Co nutrient in food. Goitrogens, Enzymes. Ant vitamins, Antibodies, Fluorides. Additives.
5. **Dietary Standards**

Scientific basis of standards uses and misuses of dietary standards.
6. **Nutrient Inter relationship**
 1. Protein interrelation ship
 2. Amino Acids and Vitamins
 3. Vitamins and Minerals
7. **Nutrition Management in special condition- Space travel**

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Semester - IIIPAPER - IIIINSTITUTIONAL FOOD ADMINISTRATION**Total Marks - 80**

1. Introduction to Food Service Systems- Definition of the catering industry. Various types of catering, establishment. Welfare Catering, residential establishment catering for industry.
Evolution of the food service industry.
Characteristics of the various types of food service units.
2. Approaches to Management.
Theories of Management
Aspects of management
Steps and function of management
Management tools
3. Strategies in Planning
Conceptual strategy
Marketing strategy
Financial Strategy
Types of plans
4. Management of Resources
Finance
 - Determining the finance needed to establish or run an unit.
 - Budgets
 - Sources of finance
 - Planning adequate cash flow
 Space & Equipment
 - Steps in planning layouts
 - Determining equipment
 - Selection and placement
 - Maintenance of equipment
 - Layout analysis
 Material
 - Menu planning
 - Planning the material needed
 - Methods of selection
 - Storage
 - Quantity food production



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Semester - III

PAPER -IV

FOOD MICROBIOLOGY

Total Marks - 80

1. Microorganisms of importance in food: Their primary sources in foods Morphology cultural characteristics and biochemical activities.
2. Factors affecting the growth of microorganism in food. Intrinsic and Extrinsic parameters that affect Microbial growth.
3. Methods of isolation and detection of Microorganism or their products in food. Conventional methods. Rapid methods (Newer techniques) Chemical methods and PCR (Polymers chain reactions) .
4. Spoilage of different groups of foods Cereals and cereal products vegetables and fruits meat and meat products. Eggs and poultry fish milk and milk products.
5. Food preservation- Physical methods- Drying, freeze drying, cold storage Heat treatment Irradiation High pressure processing Chemical Preservatives and Natural antimicrobial compounds.
6. Foods borne disease Bacterial and viral food borne important animal parasite.
7. Role of microbes in fermented foods.

REFERENCES

- [1] Pelzar, M.I. and Reid, R.D. [1993] Macgrew Hill Book Company, New York, 5th ed.
- [2] Atlas.M. Renold [1995]-Principles of Microbiology, Mosbey Year Book, Inc Missouri, USA.

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A large checkmark-like signature on the left.
A signature resembling "L.A." on the right.
A signature resembling "B" below the checkmark.
A signature resembling "S" below "L.A."
The word "Twinkle" written below "S".
The word "Suman" written above "Twinkle".

SEMESTER -3rd Semester

PRACTICAL-1st

Methods of Biochemical investigations

Total Marks - 100

1. Estimation of Total Lipid Profile in the given blood sample.
2. Estimation of Sodium and Potassium by Flame Photometry.
3. Estimation of the Total Nitrogen by Kjaldohl Method.
4. Estimation of the fat in food by Sauxlet Method.
5. Estimation of the Calcium by Clark and Collip Method.
6. Estimation of the Energy Value of food by Bomb Colorimeter.
7. Estimation of the Serum Albumin of the given serum sample.
8. Separation and identification of Amino Acids by Paper Electrophoresis.
9. Estimation of serum urea in the given serum.
10. Estimation of Serun Creatinine in the given serum.
11. Estimation of Enzymes in the given serum.

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SEMESTER - 3rd

Practical - 2nd

INSTITUTIONAL FOOD ADMINISTRATION

Total Marks - 100

1. Market survey and analysis of processed and finished products.
2. Evaluation of Food Service units- 2 Conventional, commissaries.
3. Market survey of Food service equipment.
4. Layout analysis of Kitchens-2
5. Planning menus for quantity.
 - Banquet
 - Outdoor catering
 - Packed meals
 - Restaurant
6. Standardizing recipes for quantity 100, 250, 500.grams.
7. Cost Analysis of menus in- -
 - College canteen
 - Hostel mess
 - Hospitals (private, charitable government)
8. Analysis of Food safety and Hygiene.

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**M.Sc. Final Food & Nutrition
MARKING SCHEMES**

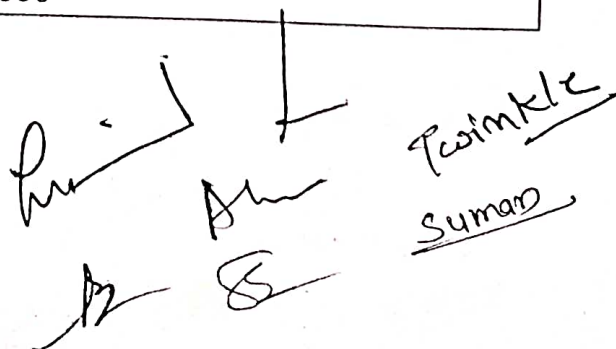
Semester - IV

THEORY

Name of the Paper	Theory	Internal Assessment	Seminar	Total
Method of biochemical Investigations	80	10	10	100
Advanced Nutrition	80	10	10	100
Institutional Management	80	10	10	100
Maternal Nutrition	80	10	10	100

PRACTICAL-

Analytics of Nutrients practical	100
Project Work (in Material Nutrition & Food Microbiology)	100
Total Marks = 600	



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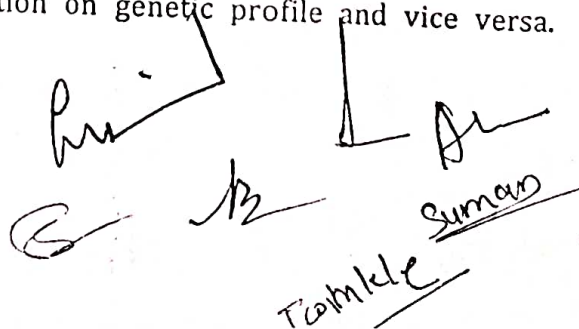
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SEMESTER - IV**PAPER - I****METHODS OF BIOCHEMICAL INVESTIGATIONS****Total Marks - 80**

1. Biological Oxidation-The redox potential, the biological Chain, The energy Production. Oxidative Phosphorylation, Inhibitors of the Chain.
2. Immunology-types, principles and related advancements. Heptans, Adjuvants, Antigens- Structure Exo and Exo toxins, Antigen and Antibody-interactions site of Antibody productions, Anti toxins, Agglutinins, and Precipitins, Lysins, Complement Reactions, Fixation Reactions, Opsonins, Hypersensitivity, Anti Histamines.
3. Electrolytic Dissociation- Acids, Bases, Salts, Buffers, Hendersen Hasselbach Equation. Theory of Indicators and Principles of measurement of pH.
4. Basics of Instrumentation- calorimetric, Photometry, Fluorimetry, and Spectrophotometry, Their Principles, Instrumentations and their applications in the field of biological sciences.
5. Chromatography-Different Techniques, Plane Chromatography, Paper Chromatography, Thin Layer Chromatography, Column Chromatography, Adsorption Chromatography, Partition Chromatography, Liquid-liquid Chromatography. Gas-Liquid Chromatography, Ion Exchange Chromatography, HPLC.
6. Use of Isotopes- Radioactive and Stable., Production of Isotopes, Synthesis of Stable Compounds, Measurements of Radio-activity, The Tracer Techniques, Uses of Isotopes as Tracer in Biological Sciences, Commonly used tracer, safety aspects, Dosimetry.
7. NMR and its applications.- Basic Principals of Nuclear Magnetic Resonance, Magnetic Properties of nucleus, Hyperfine Splitting, Instrumentation, Spin Labelling.
8. Neutrogenomics-Basics of effect of nutrition on genetic profile and vice versa. Personalised Therapy.


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Semester - IVPAPER - IIADVANCED NUTRITION**Total Marks - 80**

Energy : Energy content of foods. Physiological fuel value- review. Measurement of Energy expenditure: MBR, thermal effect of feeding and physical activity, and methods of measurement. Estimating energy requirements of individuals and groups. Regulation of energy metabolism: control of food intake, digestion, absorption and body weight.

Carbohydrates: Types, classification, digestion, and transport- review dietary fiber, starch-chemical composition and physiological effects, Glycemic index of foods. Sweeteners- nutritive and non-nutritive.

Proteins: Classification, digestion, absorption and transport- review. Metabolism of proteins: Role of muscle, liver and gastro intestinal tract. Protein quality, methods of evaluating protein quality. Protein and amino acid requirements. Therapeutic applications of specific amino acids.

Lipids: Classification, digestion, absorption, transport- review, Functions of EFA, Role of n-3: n-6 fatty acids in health and disease Requirements of total fat and fatty acids. Prostaglandin.

Minerals: (Note: For each nutrient sources, bio-availability, metabolism, function, requirements. RDI, deficiency and toxicity, interactions with other nutrients are to be discussed.

Macro minerals: calcium, phosphorus, magnesium, sodium, potassium and chloride. Microminerals: iron, copper, zinc, manganese, iodine, fluoride.

Trace minerlas: Selenium, cobalt, chromium, vanadium, silicon, boron, nickel.

Vitamins: Historical background, structure, food sources, absorption and transport, metabolism, biochemical function, assessment of status. Interactions with other nutrients. Physiological, pharmacological and therapeutic effects, toxicity and deficiency with respect to the following:

a) **Fat soluble**: Vitamins A.D.E & K

b) **Water soluble**: Thiamine, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, ascorbic acid, cyanocobalamin, choline, inositol.

REFERENCES

1. Annual reviews of Nutrition. Annual Review Inc. California, USA.
2. Shits M.E. Op.. Shile M. and Ross C. [1988] Modern Nutrition in Helath and Diseases.

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PAPER-III**SEMESTER-IV****INSTITUTIONAL MANAGEMENT****Total Marks - 80****Staff functions of personal management**

- Manpower planning
- Manpower placement
- Recruitment, induction, training, motivation and performance appraisal.

Time and Energy

- Measures for utilization and conservation

Cost accounting/analysis

- Food cost analysis
- Records to be maintained
- Reports and trend analysis

Marketing and sales management

- Marketing strategies
- Sales analysis
- Market promotion

Quality assurance

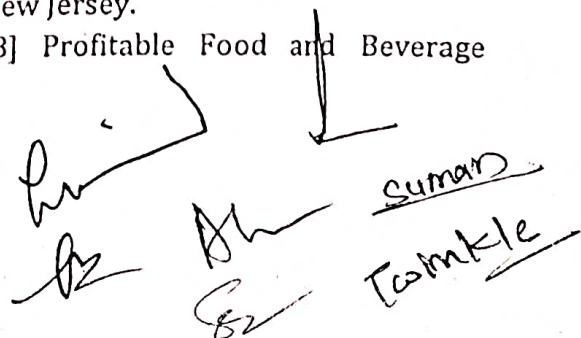
- Food quality
- Total quality management

Food safety and Hygiene-

- Hygiene and sanitation, Safety and Security
- Environmental Hygiene.
- Food Handling Practices.

Personal Hygiene**Customer Perceptions and Hazards****References**

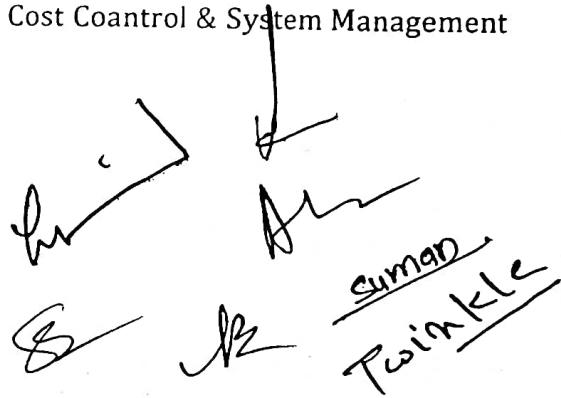
1. West. B. Bessic & Wood. Levelle [1988] Food Service management 6th Indian Revised be Harger Fv. Shuggart SG & Palgne-Palacio June Macmillian Publications company New York.
2. Sethi Mohini [1993] Catering Management An integrated Approach 2nd Edition Wiley Publication.
3. Kotas Richard & Jayawardardene, C (1994): Profitable Food and Beverage Management. Hodder & Stoughton Publication
4. Brodner. J. Maschal. H.T.. Carlon. H.M. [1982] Profitable Food and Beverage Operation 4th Edition, Hayden Book company New Jersey.
5. Green. E.F., Drake. G.G. Sweeny. J.F. [1978] Profitable Food and Beverage Management Planning, Planning, Operations



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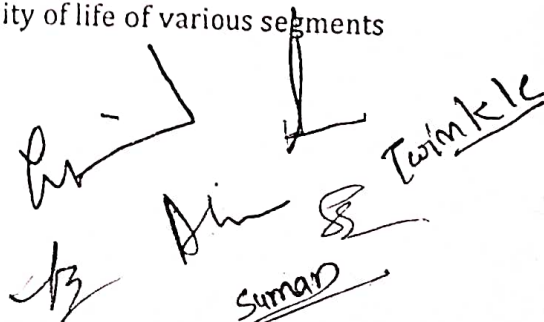
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- Hayden Book Company. New Jersey
6. Knootz, H₂O Donnel C [1968] Principal of Management McGraw Hill Book Company Personnel Management.
 7. Desseler, Garry [1986] Personnel Management Modern Concepts and Techniques, Prentice Hall New Jersey.
 8. Kumar, H.L. [1986] Personnel Management in Hotel and Catering Industries, Metropolitan Book Company N. Delhi.
 9. Hichcock, M.J. [1980]: Food Service System Administration. Macmillan Publishing Company. Cost Control.
 10. Keiser, J. & Kaillo E. [1974]: Controlling and Analysis of Cost in Food Service Operations Wiley and Sons N. York.
 11. Khari, W.L. [1] [1977] Introduction To Modern Food and Beverage Service. [1979] Advanced Modern Food and Beverage service. Prentice Hall Series.
 12. Coltman. M.M. [1977] : Food and Beverage Cost Control Prentice Hall Series.
 13. Levison [1976]: Food and Beverage Operation Cost Coontrol & System Management Prentice Hall series.

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PAPER - IV**Semester - IV****MATERNAL NUTRITION****Total Marks - 80**

1. Current Nutrition and Health Status of Women and Children in India.
2. Changing concepts and controversies in Maternal and Child Nutrition.
3. Importance of Maternal Nutrition:
 - Importance of nutrition prior to and during pregnancy.
 - Pre-requisites for successful outcome. Effect of under-nutrition on mother-child dyad including pregnancy outcome and Maternal and Child Health-Short term and Long term.
 - Physiology and endocrinology of pregnancy and embryonic and fetal growth and development.
 - Nutritional requirements during pregnancy.
 - Adolescent Pregnancy.
 - Pregnancy and AIDS
 - Pregnancy and TB.
 - Intra-uterine growth retardation
 - Complications of pregnancy and management and importance of antenatal care.
 - Congenital Malformation fetal alcohol syndrome and gestrional diabetes mellitus.
4. Lactation:
 - Development of mammary tissue and role of hormones.
 - Physiology and endocrinology of lactation- Synthesis of milk components, let down reflex role of hormones, lactation amenorrhoea, effect of breast feeding on maternal health.
 - Human milk composition and factors affecting breastfeeding and fertility.
 - Management of lactation- Pre-natal breastfeeding she education Rooming in problems- sore nipples engorged breast inverted nipple etc.
 - Baby friendly hospitals initiative
 - Breast feeding in the age of AIDS
5. Infant physiology and the pre-term and LBW infants: Implications for feeding and management.
6. Growth and development during infancy, childhood and adolescence.
7. Feeding of infants and children and dietary management.
8. Malnutrition in mothers and children: etiology and management (in brief).
9. Concept of small family, methods of family- planning, merits and demerits.
10. Policies and programmes for promoting maternal and child nutrition and health.
11. Nutritional assessment as a tool for improving the quality of life of various segments of the population including hospitalized patients.



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12. Current methodologies of assessment of nutritional status, their interpretation and comparative appheations of the following:
 - Food consumption
 - Anthropometry
 - Clinical and Laboratory
13. Nutritional Surveillance- Basic concepts, uses and setting up of surveillance systems
14. Monitoring and Evaluation.


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PRACTICAL -- I

ANALYTICS OF NUTRIENTS

Total Marks - 100

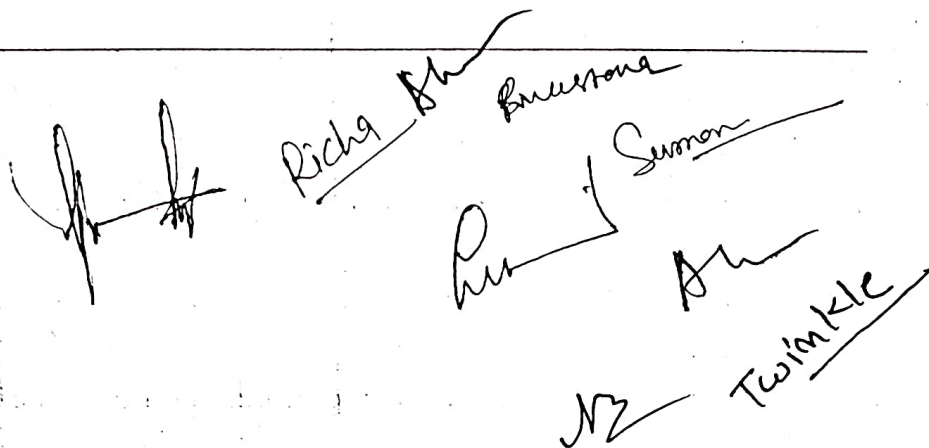
1. Estimation of Ascorbic Acid in Foods.
2. Estimation of Saponification Value of the given fat.
3. Estimation of the Iodine Number of the given fat.
4. Estimation of the Acid Value of the given fat.
5. Estimation of the Serum Glucose of the given Serum Sample.
6. Estimation of the Total Protein of the given serum sample.
7. Estimation of the Serum Albumin of the given serum sample.
8. Separation and Identification of Amino Acids by Paper Chromatography.

Richa BinayansSumanTwinkleAnuSuman

SEMESTER - IVPRACTICAL --IIPROJECT WORK

Total Marks - 100

1. Projects related to the community problems of maternal and child nutrition will be under taken.
2. Microbiology-
 1. Preparation of common Laboratory media and special media for cultivation of bacteria yeast & Molds.
 2. Staining of bacteria Grams. Staining acid fast. Motility of bacteria staining of yeast and molds.
 3. Cultivation and identification of important molds and yeast (Slides)
 4. Bacteriological analysis of water and milk. Total count.
 5. Enzymatic Activities of different microbes in the culture media.

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