

GOVT. D.B. GIRLS' P.G. AUTONOMOUS COLLEGE
RAIPUR (CHHATTISGARH)

FACULTY OF HOME SCIENCE

SYLLABUS
OF
M.SC. (FOOD & NUTRITION)
2020-21
IST AND IIIRD SEMESTER

M.Sc. FOODS & .NUTRITION
Theory
Part A
M.Sc. Ist Semester

Part A

No.	Title	Marks.				
		Credit	Theory	Test	Seminar	Total
Paper I	Research Methodology	4	80	10	10	100
Paper II	Nutritional biochemistry	4	80	10	10	100
Paper III	Clinical nutrition	4	80	10	10	100
Paper IV	Food science	4	80	10	10	100
Part B		4				
S.N.	Practical					Marks
1	Food Science And Therapeutic Nutrition					100
	Total Credits	20				

Signature of chairman

Signature of expert (subject)

GOVT.D.B.GIRLS'P.G.(AUTONOMOUS)COLLEGE,RAIPUR
DEPARTMENT OF HOME SCIENCE
M.Sc. FOODS & NUTRITION
Ist SEMESTER
SESSION: 2020-21

PAPER: I

NAME OF PAPER: **RESEARCH METHODOLOGY**

MAXIMUM MARKS: **80**

NUMBER OF UNITS: **IV**

Unit I

1. Science, scientific methods and approach.
2. Social research and surveys: Meaning, definition, nature, scope, objects, types. Distinction between social survey and research.
3. Pretesting and pilot survey.

Unit II

4. Hypothesis: Definition, sources, characteristics, importance, main difficulties in the formation of hypothesis, disadvantage.
5. Sources of data: Primary and secondary sources.
6. Methods or techniques of data collection. Observation, Interview Schedule, questionnaire and case-study.

Unit III

7. Sampling : Meaning, characteristics, advantages and disadvantages. types:-Random sampling purposive sampling stratified sampling Other sampling method
8. Classification and tabulation of data.

Unit IV

1. Analysis and interpretation of data (Parametric & Non parametric Data)
2. Preparation of the report.
3. Diagrammatic presentation of data.

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Name	In the capacity of chairman	
Chairman Dr.J.R.Tiwari		
Subject Expert (VC nominee)		
1 Dr.Varsha Raghuuvanshi	2 Dr.A.Palta	3 Dr. S. Sen
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Member of the Department		
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SESSION: 2020-21

PAPER: II

NAME OF PAPER: **NUTRITIONAL BIOCHEMISTRY**

MAXIMUM MARKS: **80**

NUMBER OF UNITS: **IV**

Unit I

1. **Heteropolysaccharides** – Definition, classification, structure and properties of glycoprotein and proteoglycans.
2. **Plasma proteins** – Nature, properties and function.
3. **Intermediately metabolism** – Reactions, standard for energy changes and regulation, carbohydrates – glycolysis, glyconeogenesis, citric acid cycle, hexose-mono-phosphate pathway.
4. **Lipids** – Beta-oxidation, denovo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids and triglycerol.

Unit II

5. **Purines and pyrimidines** –Source and Biosynthesis of purines and pyrimidines.
6. **Nucleic acids** – DNA replication and transcription.
7. DNA Transcription and recombinant –
 - Bio medical importance, restriction enzymes, cloning, libraries and library construction.
 - Gene Mutation – Codon, characteristics of genetic code, Wobble, Single base changes, transition transversion.
8. **Protein biosynthesis** – Initiation, formation of 40s initiation complex, formation of 80s initiation complex, elongation, steps of elongation.

Unit III

8. **Hormones** – General Characteristics , Classification & Mechanism of action, assay of hormones. Chemistry and functions of different hormones – Thyroxine, TSH, LH, ACTH And Insulin.
9. **Minerals** – Trace elements, their physiological functions, sources, absorption, excretion and deficiency of iron, copper, iodine, zinc and selenium.

Unit IV

10. Detoxification in the body – Metabolism of foreign compounds, oxidation, conjugation, reduction, hydrolysis.
11. Major alteration in carbohydrates, protein and fat metabolism in chronic nutrition relate degenerative disease. (Diabetes, Heart diseases).

References:

1. Deb, T.C. – Principles of Biochemistry.
2. Harper – Physiological Biochemistry.
3. West and Todd – Text Book of Biochemistry.
4. Lubert / Stryer – Text Book of Biochemistry.

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PAPER:III

NAME OF PAPER: CLINICAL NUTRITION

MAXIMUM MARKS:**80**

NUMBER OF UNITS:**IV**

Unit I

1. Etiopathophysiology, clinical symptoms, Complications, prevention and recent advances in nutritional management of GIT Disorders
 - (i) **Peptic ulcer** – Aetiology, symptoms, dietary modification.
Intervals of feeding, bland diet, four stage diet therapy, prevention of recurrence.
 - (ii) **Diarrhoea**- Classification, modification of diet with special emphasis to fibre and fluids.
 - (iii) **Constipation** – Classification, dietary consideration.
 - (iv) **Ulcerative colitis** – Symptoms, dietary treatment
 - (v) **Sprue** – Types, dietary consideration.

2. **Pancreatic disorders** – Etiology, Pathogenesis and nutritional care.

Unit II

3. Diseases of **liver and gall bladder** :
 - (i) **Infective Hepatitis** – Types and dietetic management.
 - (ii) **Cirrhosis** – Types and dietary management.
 - (iii) **Cholecystitis** and **Cholelithiasis** –dietetic management.

4. **Cardio Vascular Diseases** –
 - (i) Familial Hypercholesterolemia –nutritional care.
 - (ii) Atherosclerosis–Etiological,factors,pathogenesis,dietetic management.
 - (iii) Hypertension – Classification, etiology, nutritional care.

Unit III

5. **Renal Diseases** :
Basic renal functions, Classification of renal diseases.
 - (i) Glomerulonephritis – Acute and chronic – Symptoms and dietetic treatment
 - (ii) Nephrosis – Symptoms and principles of nutritional care.
 - (iii) Renal failure – Acute and chronic renal failure, dialysis.
 - (iv) Renal Calculi – Etiology, types of stones and nutritional Care. Acid and alkaline ash diet.

6. **Fevers and infections-**
Types of fever
Tuberculosis, typhoid and malaria -Dietetic management

Unit IV

7. Historical background, prevalence, etiology, biochemical and clinical manifestations, preventive and therapeutic measures for metabolic disorders.
Diabetes mellitus
(i) Incidence and predisposing factors.
(ii) Symptoms, types and diagnosis
(iii) Metabolism in diabetes
(iv) Dietary management
(v) Hypoglycemic agents and insulin
(vi) Complication of diabetes.
8. Disorders of thyroid gland :
Normal Thyroid Function
(i) Hyperthyroidism – Symptoms and care.
(ii) Hypothyroidism – Symptoms and care

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PAPER:IV
NAME OF PAPER:FOOD SCIENCE

MAXIMUM MARKS: **80**

NUMBER OF UNITS: **IV**

Unit I

1. **Water-** structure and Physical properties of water and ice and chemical nature, adsorption phenomena, types of water solution and colligative properties.
 - Free bound water
 - Water activity and food spoilage.
2. **Food dispersion** – Colloidal sol, stabilization of colloidal systems, Rheology of food dispersion.
 - Gels : Structure, formation, strength, types and permanence.
 - Emulsion : Formation, stability, surfactants and emulsifiers.
 - Foams : Structure, formation and stabilization.

Unit II

Polysaccharides, sugars and sweeteners:

- 3 **Starch:** Structure, Gelatinization, Characteristics of some food starches, modified food starches. Non starch polysaccharides : Cellulose, hemicelluloses, pectin, gum, animal polysaccharides.
4. **Sugars and sweeteners:** Sugars, syrups, potent sweeteners, sugar product.
 - Sweetener chemistry related to usage in food products : Structural relationships to sweetness perception, hydrolytic reactions, solubility and crystallization, hygroscopicity, fermentation, non-enzymatic browning.
5. **Cereals and cereals products:**
 - Cereals grains : Structure and composition
 - Flours and flour quality
 - Extruded foods, breakfast cereals, wheat germ, bulger, puffed and flaked cereals

Unit III

6. **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 (Rancidity) and antioxidants.

Unit IV

7. **Dairy products: Milk** Composition, physical and functional properties. Denaturation effects of processing and storage.
8. **milk products:** Cultured milk, yogurt, butter, whey, cheese, concentrated and dried products, frozen desserts, dairy product substitutes.
9. **Enzymes:** Nature of enzymes, stability and action. Proteolytic enzymes, oxidase, lipases, enzymes decomposing carbohydrates, immobilised enzymes
Protein denaturation, non enzymatic browning

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NAME OF PAPER:FOOD SCIENCE AND THERAPEUTIC NUTRITION
PRACTICAL I

Max Mark : 100

Part - A

1. Market Survey of commercial nutritional supplements and nutritional support substrates.
2. Case study- Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription.
3. Use of food exchange list.
4. Planning and preparation of diets for patients with common multiple disorders and complications -
Hypertension,
Atherosclerosis
Liver diseases-infective hepatitis,cirrhosis,-
Kidney diseases-glomerulonephritis,nephrosis

Part – B

5. Effect of solutes on boiling point and freezing of water.
6. Effect of types of water on characteristics of cooked vegetables, pulses and cereals.
7. Sugar and jaggery cookery : Relative sweetness, solubility and sizes of sugars, stages of sugar cookery, caramelization, crystallization, factor affecting crystal formation.
8. Starches, vegetable gums and cereals : Dextrinization, gelatinization, retrogradation, thickening power. Factors affecting gels and gluten formation.
9. Jams and jellies: Pectin content of fruits, role of acid, Pectin and sugar in jam and jelly formation. Use of gum as emulsifiers/stabilizers.
10. Fats and oils : Flash Point, melting point and smoking point. Role of fats and oils in cookery as shortening agent, frying medium. Factors affecting fat absorption. Fat crystals, plasticity of fats, permanent and semi-permanent emulsions.
11. Milk and milk Products: Scalding, denaturation. Effects of acid, salt, alkali, sugar, heat, enzymes, polyphenols on milk. Khoa, curd paneer, cheese (ripened and unripened).
12. Egg: Structure, assessing egg quality. Use of egg in cookery-emulsion, air incorporation, thickening, binding, gelling-method of egg cookery and effect of heat, white forms and factors affecting foam.
13. Pulses: Effect of various cooking and processing methods on various functional properties of pulses and their products.
14. Gelatin: Gelatin gel, strength and factors affecting gelation.
15. Fruits and vegetables: Pigments – Effects of cooking, metal ions, Ph, effect of various cooking processes on different characteristics of vegetables, prevention of enzymatic browning.

16. Leavened products: Fermentation – Use of microorganisms (lactic acid, yeast), steam as an agent, chemical agents.
17. Frozen Desserts: Factors affecting ice crystal formation. Quality characteristics of frozen desserts.

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M.Sc. FOODS & .NUTRITION
Theory
Part A
M.Sc. IIIrd Semester

Part A

No.	Title	Marks.				
		Credit	Theory	Test	Seminar	Total
Paper I	Food Microbiology	4	80	10	10	100
Paper II	Nutrition & Health of Woman & Children	4	80	10	10	100
Paper III	Nutrition for Health & Fitness	4	80	10	10	100
Paper IV	Advanced Nutrition	4	80	10	10	100
Part B		4				
S.N.	Practical					Marks
1	Nutrition & Food Microbiology					100
	Total Credits	20				

Signature of chairman

Signature of expert (subject)

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DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc. FOODS AND NUTRITION
IIIrd SEMESTER
SESSION: 2020-21

PAPER:I

NAME OF PAPER: FOOD MICROBIOLOGY

MAXIMUM MARKS:**80**

NUMBER OF UNITS:**V**

Unit I

1. Bacterial morphology, structure, staining, culture media, culture method and identification of bacteria.
2. Growth and Nutrition of Bacteria :
Intrinsic and extrinsic parameters that affect microbial growth.

Unit II

3. Microorganism important in food microbiology – Mold, yeast, bacteria.
4. **Spoilage of different groups of foods:**
 - (i) Cereals and cereal products
 - (ii) Vegetables and fruits
 - (iii) Fish and meat
 - (iv) Eggs and poultry
 - (v) Milk and milk products
 - (vi) Canned foods

Unit III

5. Contamination of foods
6. **Food Preservation:**
 - (i) General principles of food preservation:
Asepsis, removal of micro-organism, maintenance of anaerobic conditions.
 - (ii) Preservation by use of high temperature.
 - (iii) Preservation by use of low temperature
 - (iv) Preservation by drying.
 - (v) Preservation by food additives
 - (vi) Preservation by radiation.

Unit IV

7. **Foods in relation to disease:**
 - (i) Food borne illness: Bacterial and viral food borne disorders. Food borne important animal parasites, mycotoxins.

8. **Fermented foods:**
 Role of microbes in fermented foods –
 (i) Fermented dairy products
 (ii) Fermented vegetables
 (iii) Fermented meat
 (iv) Fermented fish
 (v) Beverage and distilled products.

Unit V

9. **Indices of Food Sanitary Quality:**
 (i) Microbial criteria of food.
 (ii) Microbial standards and food safety
10. Controlling the microbial quality of foods -
 (i) Quality control using microbial criteria.
 (ii) The HACCP (Hazard analysis and Critical Control Point) SYSTEM
11. Anti microbial therapy
 12. Food laws

Reference:

1. Frazier, W.C. and Westhoff, D.C. (1998): Food Microbiology. Tata McGraw Hill Book Company, New Delhi, 4th Edition.
2. James, M.J. (1987): Modern food Microbiology, CBS Publishers, New Delhi, 3rd Edition.
3. Pelezar, M.I. and Reid, R.D. (1993): Microbiology, McGraw Hill Book Company, New York, 5th edition.
4. Adams, M.R., Moss, M.O. (1995): Food Microbiology, New age international (P.) Ltd., Delhi.
5. Banwart G.J. (1987): Basic Food Microbiology, CBS Publishers and Distributors, Delhi.

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DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc.FOOD AND NUTRITION
IIIrd SEMESTER
SESSION:2020-21

PAPER: II

NAME OF PAPER: NUTRITION AND HEALTH OF WOMAN AND CHILDREN

MAXIMUM MARKS: 80

NUMBER OF UNITS:V

Unit I

1. Role of women in national development.
2. **Women in family and community:**
Demographic changes, menarche, marriage, fertility, morbidity, mortality, life expectancy, sex ratio, widowhood.
3. **Women and Society:**
Women's role, their resources and contribution to family and effect of nutritional status.

Unit II

4. **Women and Health:**
Health facilities. Disease pattern and reproductive health
5. Policies and programs for promoting maternal and child nutrition and health.
6. Concept of small family. Methods of family planning – merits and demerits.

Unit III

7. Importance of nutrition prior to and during pregnancy- prerequisites for successful outcome. Effect of under nutrition on mother and child including pregnancy outcome and maternal and child health- Short term and long term effect.
8. Physiology and endocrinology of pregnancy and embryonic and fetal growth and development.
9. **Nutritional requirements during pregnancy:**
Adolescent pregnancy, Pregnancy and T.B., IUGR, gestational diabetes.

Unit IV

10. 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 amenorrhea, effect of breast feeding on maternal health.

11. Human milk composition and factors effecting breast feeding. Human milk banking.

12. Management of Lactation:

Prenatal breast feeding, skill education. Rooming in problems – Sore nipples, engorged breast, inverted breast.

13. Exclusive breast feeding

Unit V

14. Infant Physiology:

Pre-term and low birth weight infant-Implication for feeding and management.

15. Growth and development during infancy, childhood and adolescents.

16. Feeding of infants and children and dietary management.

17. Malnutrition-Etiology and management.

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**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc. FOODS AND NUTRITION
IIIrd SEMESTER
SESSION:2020-21**

PAPER: III

NAME OF PAPER: NUTRITION FOR HEALTH AND FITNESS

MAXIMUM MARKS: 80

NUMBER OF UNITS:V

Unit I

1. Definition, components of fitness

- (a) Anatomical fitness
- (b) Physiological fitness
- (c) Psychological Fitness

- Physiological fitness :

- (a) Growth and development, (b) Strength, (c) Speed, (d) Skill, (e) Stamina or endurance, specific fitness, general fitness and health status.

2. Holistic approach to the management of fitness and health:

Unit II

3. Review of different energy systems for endurance and power activity:

- (a) Endurance : Definition, classification of endurance, factors affecting endurance.
- (b) Fuels and nutrients to support physical activity : Shifts in carbohydrates and fat metabolism, mobilization of fat stores during exercise.

4. Nutrition in Sports : Sports specific requirement.

Unit III

- 5. Pregame and post game meals. Assessment of different nutrigenic aids. Commercial supplements.
- 6. Diets for persons with high energy requirements, stress, fracture and injury.
- 7. Water and electrolyte balance: Losses and their replenishment during exercise and sports. Effect of dehydration.

Unit IV

8. (A) Significance of physical fitness in the prevention and management of :
(i) Diabetes mellitus, (ii) Cardiovascular disorders, (iii) Bone health and obesity.
9. Nutrition and exercise regimes for pre and post natal fitness.

Unit V

10. A. Defining nutritional goals / guidelines appropriate to health and prevention and management of the chronic degenerative disorder -
(a) Cardiovascular disorders, (b) Diabetic mellitus (c) Cancer, (d) Bone health and obesity
B. Various dietary regimes for weight reduction.
11. Alternative systems for health and fitness like ayurveda, yoga, meditation, vegetarianism and traditional diets.

References :

1. Mahan, L.K. and Ecott-Stump, S. (2000) : Krause's Food, Nutrition and diet Therapy, 10th Edition W.B. Saunders Ltd.
- 2.Sizer, F. and Whitney, E. (2000) : Nutrition – Concepts and Controversies, 8th Edition, Wadsworth Thomson Learning.
3. Whitney, E.N. and Rolfes, S.R. (1999): Understanding Nutrition, 8th Edition, West/Wadworth, an International Thomson Publishing Co.
4. Ira Wolinsky (Ed) (1998): Nutrition in Exercise and Sports, 3rd Edition, CRC Press.
5. Parizkova, J. Nutrition, physical activity and health in early life, Ed. Wolinsky, I, CRC Press.
6. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
7. McArdle, W.Katch, F. and Katch, V. (1996): Exercise Physiology, Energy, Nutrition and Human Performace, 4th Edition, 4th Edition, Williams and Wilkins, Philadelphia.

Journals:

1. Medicine and science in Sports and Exercise
2. International Journal of Sports Nutrition

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IIIrd SEMESTER
SESSION: 2020-21

PAPER: IV
NAME OF PAPER: ADVANCED NUTRITION

MAXIMUM MARKS: 80

NUMBER OF UNITS:V

Unit – I

1. **Energy:**

- (a) Review of Energy content of foods, physiological fuel values-.
- (b) Measurement of energy expenditure – BMR, RMR. Thermal effect of feeding and physical activity. Methods of measurement of basal metabolism.
- (c) Estimating energy requirements of individuals.
- (d) Regulation of energy metabolism – Control of food intake, digestion, absorption and body weight.

Unit II

2. **Carbohydrates:**

- (a) Review of Types, classification, digestion and transport of carbohydrates
- (b) Dietary fiber, fructo-oligosaccharides
Starch :chemical composition and physiological effects.
- (c) Glycemic index of foods,sweeteners – Nutritive and non-nutritive.

Unit III

3. **Proteins:**

- (a) Review of Classification, Digestion, absorption and transport of Proteins
- (b) Role of liver and gastro intestinal tract in protein metabolism.
- (c) Protein quality – Methods of evaluating Quality.
- (d) Protein and amino acid requirements, specific functions of amino acids.

4. **Lipids:**

- (a) Review of Classification, digestion, absorption and transport of Lipids
- (b) Functions of fat, EFA: Role of N-3, N-6 fatty acids in health and diseases
requirement of total fat and fatty acid.
- (c) Prostaglandins, phospholipids, cholesterol.

Unit IV

5. **Water:** Water balance and its regulation.
6. **Minerals :**
(For each nutrient sources, bioavailability, metabolism, function, requirements, RDI, deficiency and toxicity to be discussed)
- (a) Macro minerals : Calcium, Phosphorous, Magnesium, sodium, potassium and chlorides.
- (b) Micro Minerals: Iron, copper, zinc, manganese, iodine, fluoride.
- (c) Trace minerals: Selenium, Cobalt, chromium, vanadium, boron, nickel.

Unit V

7. **Vitamins:**
Structure, food sources, absorption and transport, metabolism, biochemical functions, assessment of status physiological and therapeutic effect. The toxicity and deficiency with respect to the following:
- (a) Fat soluble: Vitamin A,D. E And K
- (b) Water soluble: Thiamin, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, choline, cyanocobalamin, inositol, ascorbic acid.

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**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc. FOOD AND NUTRITION
IIIrd SEMESTER
SESSION: 2020-21**

NAME OF PAPER: NUTRITION AND FOOD MICROBIOLOGY

PRACTICAL

Max Mark : 100

Part A- Nutrition

1. Assessment of nutritional status of community by using anthropometric and clinical techniques.
2. Development of low cost nutrition recipes suitable for various vulnerable section of the population.
3. Diet planning and preparation for P.E.M., Vitamin A deficiency Anaemia and Diarrhea.
4. Collection and storage of biological samples for clinical investigation.
5. Physiological parameters like heart rate and blood pressure.
6. Assessment of coronary risk profile.
7. Planning diets and formulating dietary guidelines for-
 - (i) Fitness and health
 - (ii) Obesity management
 - (iii) Management of diabetes mellitus and CVD.
8. Planning and preparation of diet for elderly in health and sickness.
9. Visit to ongoing public health nutrition programme.

Part B -Food Microbiology

1. Preparation of common laboratory media and special media for cultivation of bacteria, yeast and moulds.
2. Preparation of culture for yeast and moulds.
3. Preparation of bacterial smear.
4. Simple staining of bacterial culture.
5. Gram staining of bacterial culture.
6. Morphological study of fungi by culture technique.
7. Microbiological study of water.
8. Microbiological analysis of food samples.
9. Determination of quality of milk sample by methylene blue reductase test.
10. Check the milk for the presence of proteins, urea, sugar, starch.

11. Visit to food processing unit or any other organization dealing with advanced method in food microbiology.

References :-

1. Charley, H. (1982): Food Science (2nd edition), John Wiley and sons, New York.
2. Potter, N. and Hotchkiss, J.H. (1996): Food Science, Fifth edition, CBS Publishers and Distributors, New Delhi.
3. Belitz, H.D. and Grosch, W. (1999): Food Chemistry (2nd Edition), Springer, New York.
4. Abers, R.J. (Ed) (1976): Foam, Academic Press, New York.

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GOVT. D.B. GIRLS' P.G. AUTONOMOUS COLLEGE
RAIPUR (CHHATTISGARH)

FACULTY OF HOME SCIENCE

SYLLABUS
OF
M.SC. (FOODS & NUTRITION)
2020-21

IIND AND IVTH SEMESTER

M.Sc. FOODS & NUTRITION

Theory

Part A

M.Sc. IInd Semester

Part A

No.	Title	Marks.				
		Credit	Theory	Test	Seminar	Total
Paper I	Statistics and computer application	4	80	10	10	100
Paper II	Methods of investigation	4	80	10	10	100
Paper III	Problems in human nutrition	4	80	10	10	100
Paper IV	Food chemistry	4	80	10	10	100
Part B		4				
S.N.	Practical					Marks
1	Nutritional biochemistry					100
	Total Credits	20				

Part C: On job Summer Training/Internship Training:

The students will be required to undergo an internship/on job summer training after their IInd semester examination for a period of six weeks. The areas of training will include hospitals, state run NGO, food industry etc. The students are required to submit a report after completion of their training.

Signature of chairman

Signature of expert(subject)

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CLASS: M.Sc. IInd SEMESTER
FOODS & NUTRITION
SESSION: 2020-21

PAPER:I

NAME OF PAPER: STATISTICS AND COMPUTER APPLICATION

MAXIMUM MARKS:80

NUMBER OF UNITS: IV

Unit I

- 1. Statistics:** Meaning,definition,scope,importance,characteristics,
distrust of statistics
- 2. Measurement of central tendency:**
 - Mean
 - median
 - mode

Unit II

- 3. Graphic presentation of Data: Importance,types**
 - Histogram
 - Frequency poygon
 - Frequency curve
 - Correlation:Definition,Meaning and types.
 - Methods of determining coefficient of correlation
 - Product moment method
- 4. Rank correlation. Methods of dispersion and variation:**
 - Mean deviation
 - Standard deviation
 - Quartile deviation

Unit III

5. Introducation to Computers:

What is computer? Characteristics, components of computer system ,block diagram of computer, CPU,I/O devices and memory(RAM and ROM),secondary storage devices(Hard disk, floppy disk, magnetic tape etc.

6. Analysis of variance

-One way method: Direct and shortcut.

Unit IV

7. Computer generations.
8. Classification of computer : Analog, digital, hybrid, general and special purpose computers.
9. Types of Computer: Micro, mini, mainframe and super computer.
10. Chi-square test and goodness to fit.
11. Application of student 't'test for small samples.
12. Working with Ms-word:
Getting started with word, formatting text and paragraph. Applying text and language tools. Designing pages with columns and tables, using graphics.

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CLASS: M.Sc.FOOD AND NUTRITION
IInd SEMESTER
SESSION:2020-21

PAPER: II
NAME OF PAPER: METHODS OF INVESTIGATION

MAXIMUM MARKS: **80**

NUMBER OF UNITS: **IV**

Unit I

1. Electrolytic dissociation : Principle, technique and theory of electrolytic dissociation.
2. Hydrogen ion concentration : Principle and measurement of PH, indicators, buffers.
3. Physiochemical techniques: Principles and methodology of the following-
 - (a) Diffusion
 - (b) Osmosis
 - (c) Filtration
 - (d) Surface tension
 - (e) Adsorption
 - (f) Centrifugation

Unit II

4. Chromatography: Principles, techniques and application of the following-
 - (a) Paper chromatography- Circular, ascending and descending.
 - (b) Ion exchange chromatography
 - (c) Column chromatography
 - (d) Thin layer chromatography
 - (e) Gas liquid chromatography
 - (f) High performance liquid chromatography

Unit III

5. Electrophoresis: Principles and techniques of paper and gel electrophoresis.
6. Microbiological assay : Principle and methodology of the following-
 - (a) Vitamins
 - (b) Amino acids
7. Colorimetry : Principles, applications.

Unit IV

8. Radioactive isotopes: Properties, detection and uses of radioactive isotopes in medical science.
9. Immunological methods: Principle and technique of the following-
 - (c) Radio Immuno Assay (RIA)
 - (d) Enzyme Linked Immuno sorbent Assay (ELISA)
10. Collection of biological samples.

References:

1. Hawk, P.B., Oser, B.K. and Summerson, W.H. : Practical Physiological Chemistry. Tata McGraw Hill.
2. Varley, H. : Practical Clinical Biochemistry. The English language Book Society.
3. Das, Debjyoti : Biophysics and Biophysical Chemistry. Academic Publisher, Calcutta.
4. Okotore, R.O. : Basic separation Techniques in Biochemistry. New Age International (P) Ltd. Publishers.
5. Manual of Laboratory Techniques. National Institute of Nutrition, Hyderabad.

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M.Sc. FOODS AND NUTRITION
IInd SEMESTER
SESSION: 2020-21

PAPER: III

NAME OF PAPER: PROBLEMS IN HUMAN NUTRITION

MAXIMUM MARKS: **80**

NUMBER OF UNITS: **IV**

Unit I

1. Nutritional screening and assessment of nutritional status of hospitalized and outdoor patients.
Identification of high risk patients. Assessment of patient need based on interpretation of patient data (Clinical, biochemical, biophysical, personal etc.)
2. Nutritional support service: Recent advances in techniques and feeding methods. (enteral nutrition, parenteral nutrition)
3. pre and post operative diets, Diet in burns.

Unit II

4. **Weight imbalance –**

Obesity – Types, etiology, assessment, treatment, diet and other measures, complications of obesity.

Under weight – Causes, dietetic management

5. **Neurological disorders :**

- (i) Neuritis – Etiology, nutritional care.
- (ii) Migraine – Symptoms & Dietary management
- (iii) Anorexia Nervosa – Etiology, treatment.

Unit III

6. **Diet in genetic disorders :**

Fructosuria, Galactosemia, Phenylketonuria.

7. **Musculoskeletal disorders :**

Gout – Characteristics, nutritional care

8. **Cancer :**

- Types of cancer, Nutritional effect of cancer, Nutritional disorders related to treatment,
- Nutritional care in cancer.

Unit IV

9. Prevalence , etiology, clinical manifestation, preventive and therapeutic measures for the following-

Vitamin A Deficiency

IDD

Rickets

10. Dental carries : Etiology, nursing bottle carries.

11. Nutrition in AIDS.

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IInd SEMESTER
SESSION: 2020-21

PAPER: IV
NAME OF PAPER: FOOD CHEMISTRY

MAXIMUM MARKS:**80**

NUMBER OF UNITS: **IV**

Unit I

1. Meat and Poultry : Muscle composition, characteristics and structure. Post mortem changes during processing, preservation and their effects.Heat induced changes in meat variables in meat preparation, Tenderizing treatments, meat products.
2. Eggs : Structure and composition, changes during storage. Functional properties of eggs, use in cookery. Egg processing, low cholesterol egg substitutes.

Unit II

3. Fish and sea foods : Types and composition, storage and changes during storage, changes during processing, by- product and newer products.
4. Pulses and Legumes : Structure, composition, processing, toxic constituents.
5. Nuts and oil seeds : Composition, oil extraction and by-products.

Unit III

6. Fruits and vegetables: Plant, anatomy, gross composition, structure, features and activities of living systems. Enzymes in fruits and vegetables. Flavour constituents, plant phenolics, pigments, post harvest changes. Texture of fruits and vegetables. Effects of storage, processing and preservation.
7. Spices and condiments: Composition, flavouring extracts – Natural and synthetic.
8. Beverages : Synthetic and natural, alcoholic and non-alcoholic, carbonated and non- carbonated, coffee, tea, cocoa, malted drinks.

Unit IV

9. Traditional processed products : jam, jellies & squash.
10. Protein concentrates : Hydrolysates and textured vegetable proteins, milk substitutes.
11. Fermented food-cereal based, pulse based, fruit/vegetables based like vinegar, pickle and alcoholic beverages.
12. Leavened products: Leavened agents biologically leavened and chemically leavened products. Batters and dough, bakery products.
13. Salt and salt substitutes

References :-

1. Charley,H. (1982) : Food Science (2nd edition), John Wiley and Sons, New York.
2. Potter,N. and Hotchkiss, J.H. (1996) : Food Science, fifth edition, CBS Publishers and Distributors, New Delhi.

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NAME OF PAPER: NUTRITIONAL BIOCHEMISTRY

PRACTICAL

Max Mark : **100**

Objective

This course will enable the students to-

- Understand the principles of biochemical methods used for analysis of food and biological samples.
- Perform biological analysis with accuracy and reproducibility

Note : Any ten practicals.

Part A

1. Calcium: Estimation of calcium in foods and serum.
2. Phosphorus: Estimation of inorganic phosphorous in foods and serum.
3. Ascorbic acid: Estimation of ascorbic acids in foods.
4. Proteins:
 - (a) Estimation of proteins in food.
 - (b) Estimation of albumin, globulin and albumin/globulin ratio in serum and urine.
 - (c) Estimation of hemoglobin.
5. Glucose: Estimation of glucose in blood and urine.
6. Cholesterol: Estimation of cholesterol in blood.
7. Enzyme assay: Estimation of activity of serum alkaline phosphates and trans aminase.
8. Urea and creatinine : Estimation of urea and creatinine in serum and urine.
9. Survery of pathological laboratories.

Part B

10. Acids and alkalis: Preparation of dilute solutions of common acids and alkalis and determining their exact normalities.
11. Buffers: Preparation of phosphate, carbonate-bicarbonate, ascorbic acid, acetate, chloride and phthalate buffers and determination of their ph by the use of indicators and ph meters.
12. Spectrometer: Beer Lamuert law, absorption maximum, preparation of standard curve and nutrient estimations in UV and visible range, AAS, AES, Flamephotometry.

13. Fluorimetry: Estimation of thiamin and riboflavin.
14. Chromatography: Paper- identification of amino acid by circular, ascending and descending methods. Ion-exchange- Separation of amino acids. Column Separation of proteins. Thin layer- Identification of amino acids. Gas-liquid Estimation of fatty acids, HPLC – Estimation of β -carotene and α - tocopherol.
15. Electrophoresis: Fractionation of plasma proteins.

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M.Sc. (Food and Nutrition)

M.Sc. IV Semester

Part A

No.	Title	Marks.				
		Credit	Theory	Test	Seminar	Total
Paper I	Physiology	4	80	10	10	100
Paper II	Public Nutrition	4	80	10	10	100
Paper III	Geriatric Nutrition	4	80	10	10	100
Paper IV	Research Methods in Food and Nutrition	4	80	10	10	100
Part B		4				
S.N.	Practical				Marks	
1	Dissertation and current trends in food and nutrition				75+25	
	Total Credits	20				

Signature of chairman

Signature of member(subject)

GOVT.D.B.GIRLS'P.G.(AUTONOMOUS)COLLEGE,RAIPUR

**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc.FOOD AND NUTRITION
IVth SEMESTER
SESSION: 2020-21**

PAPER:I

NAME OF PAPER: PHYSIOLOGY

MAXIMUM MARKS:80

NUMBER OF UNITS:V

Unit I

1. Cell Structure and Functions:
Levels of cellular organizations and function - Brief review. Cell Membrane, transport across cell membrane and intercellular communication, Regulations of cell multiplication.
2. Nervous System:
 - Review of structure and function of neuron. Conduction of nerve impulse, synapses, role of neurotransmitters.
 - Organisation of central nervous system, structure and functions of brain and spinal cord, afferent and efferent nerves. Hypothalamus and its role in various body functions – Obesity, sleep, memory.

Unit II

3. Endocrine System:
 - Endocrine glands – Structure, function, role of hormones, regulation of hormonal secretion. Disorders of endocrine glands.
4. Sense organs:
 - Review of structure and function. Role of skin, eye, ear, nose and tongue in perception of stimuli.

Unit III

5. Digestive System:
 - Review of structure, secretory, digestive and absorptive functions. Role of liver, pancreas and gall bladder and their dysfunction.
6. Respiratory Function:
 - Review of structure and function. Role of lungs in the exchange of gases. Transport of oxygen and carbon dioxide, respiratory quotient, hypoxia and asthma.

Unit IV

7. Circulating System:
Structure and function of heart and blood vessels. Regulation cardiac output and blood pressure, heart failure, hypertension.
8. Blood:

Formation and function of plasma protein and blood erythropoiesis, blood Clotting, blood group and histocompatibility, blood indices, use of blood for investigation and diagnosis of specific disorders, anaemia.

9. Musculo-Skeletal System:

- Structure and function of bone, cartilage and connective tissue. Disorders of skeletal system.
- Types of muscles, Structure and Function.

Unit V

10. Excretory System:

Structure and function of nephron. Urine formation. Water, electrolyte and acid base balance, diuretics.

11. Immune system:

Humoral immunity. Development of lymphocytes. Role of inflammation and defence.

12. Reproduction:

Menstrual cycle, spermatogenesis, physiological changes in pregnancy.

References:

1. Ganeng, W.J. (1985): Review of Medical Physiology, 12th edition, Lange Medical Publication.
2. Guyton, A.C. (1985): 'Functions of the Human Body', 4th edition, W.B. Saunders Company, Philadelphia.
3. Guyton, A.C. and Hall, J.B. (1996): Text book of Medical Physiology, 9th edition, W.B. Saunders Company, Philadelphia.
4. Jain, A.K. Text book of Physiology, Vol. I and Vol II, Avichal Publishing Co., New Delhi

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**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc.FOOD AND NUTRITION
IVth SEMESTER
SESSION: 2020-21**

PAPER:II

NAME OF PAPER: PUBLIC NUTRITION

MAXIMUM MARKS:80

NUMBER OF UNITS:V

Unit I

1. Concept of Public Health Nutrition:
 - Relationship between health and nutrition. Role of public nutritionist in the Health care delivery system.
2. Sectors and public policies relevant to nutrition.
3. National health care delivery system.

Unit II

4. Population dynamics:
Demography, demographic cycle, world population trend, birth rates, death rates, growth rates, demographic trends in India, age pyramid, sex ratio.
5. Environment and Health:
Water: Water pollution, surveillance of drinking water quality.
Air: Air pollution

Unit III

6. Nutritional Status:
Determinants of nutritional status of individual and populations.
7. Major Nutritional Problems:
Etiology, prevalence, clinical manifestations. Preventive and therapeutic measures of-
Macro and micro deficiencies – LBW, PEM, xerophthalmia, nutritional anemia.
 - Other nutritional problems like lathyrism, aflatoxicosis, alcoholism and fluorosis.

Unit IV

8. National Nutrition Policy
9. Approaches and strategies for improving nutritional status and health.
10. Occupational health
11. Health Planning and management

Unit V

12. Communication for Health Education.
13. Health planning in India.
14. Health Care of the community: Concept of health care, health system, health system, levels of health care.

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**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc. FOOD AND NUTRITION
IVth SEMESTER
SESSION: 2020-21**

PAPER:III

NAME OF PAPER: GERIATRIC NUTRITION

MAXIMUM MARKS:80

NUMBER OF UNITS:V

Objectives:

The course is designed to –

- Familiarize the students with the multifaceted aspects of aging.
- Make the students competent for nutritional and health care of the elderly.

Unit I

1. Aging: Definition
 - (A) Molecular changes during aging – (i) Changes in proteins, (ii)Chromatin, (iii) Cross linkers, (iv)Immune response, (v) Hormones, (vi) Ageing of cells in culture, (vii) Age pigment.
2. Mechanism of Aging-
 - (A) Somatic Mutation,
 - (B) Errors in proteins
 - (C) Gene regulation
3. Socio-Psychological aspects of aging- Especially problems of elderly women.

Unit II

4. Nutritional and Food requirement during old age-
Process of aging, nutritional requirements
5. Nutrition related problems of old age-
 - (i) Osteoporosis, (ii) Obesity, (iii) Neurological dysfunction, (iv) Anemia, (v) Malnutrition, (vi) Constipation.

Unit III

6. Degenerative diseases in old age-
 - (i) Atherosclerosis, (ii) Hypertension, (iii) Cancer, (iv) Diabetes mellitus, (v) Arthritis
7. Common complaints during old age.
8. Dietary guidelines

Unit IV

9. Drug – Food and nutrient reaction in elderly.
 - (a) Effect of drugs on food intake and absorption.

- (b) Effect of various foods and beverages on drug action.
 - (c) Drug nutritional interaction.
10. Aging and Immunity.
 11. Aging and Nutrition, nutrition and longevity, food habits of elderly people, stress during old age.

Unit V

12. Exercise, yoga, meditation in old age.
13. Policies and program of the government to the elderly.
14. Policies and program of the NGO sector pertaining to the elderly.

References :

1. Kumar V. (1996): Ageing – Indian Perspective and Global Scenario. Proceedings of international Symposium of Gerontology and Seventh Conference of the Association of Gerontology (India).
2. Bagchi, K. and Puri, S. (Ed) (1999): Diet and Aging – Exploring Some Facts. Soc. For Gerontological Research, New Delhi and Help age India, New Delhi.
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4. Shils, M.S., Olson, J.A., Shike, M. and Ross, A.C. (Ed) (1999): 9th Edition, Williams and Wilkins.
5. Sharma, O.P. (Ed)(1999): Geriatric Care in India – Geriatrics and gerontology : A Text book, M/s, ANB Publishers.
6. Aiken, L.R. (1978): The Psychology of Later Life, Philadelphia, WB Saunders Company.
7. Bergmann, Klaus (1972): Aged: Their Understanding and Care, London, Wolfe pub.
8. Binstock, R.H. and E. Shanes (eds) (1986): Handbook of Aging and Social Science, V.N. Reinhold Co., New York.
9. Blau, Zana Smith (1983): Old age in a Changing Society, New York Prints, New York.
10. Bose, A.B. and K.D. Gangrade (1988): Aging in india: Problems and Potentialities, Abhinav Pub., New Delhi.
11. Cook Alicia Skinner (1983): Contemporary Perspectives on Adult Development and Aging, New York, Macmillan.
12. Desi, K.G. (1985): Problems of Retired People in Geater Bombay, TISS, Series No. 27.
13. Ghosh. B. (1988): Contemporary social Problems in India, Bombay Himalaya Pub.
14. Homban, d. (1978): Social Challenges in Aging, London, Groom Helm.
15. Johnson Elizabeth (1982): Growing old: Social Problems of Aging, New York, Holt Rinehart and Winston.
16. Kennedy Caroll (1988): Human Development, New York, MacMillan.
17. Kimmel Douglas (1974): Adulthood and Aging, New York, Wiley.
18. Mishra Saraswati (1987): Social Adjustment in Old Age, Delhi, B.R. Pub. Corp.
19. Pinkston, P.H. and N.K. Linsk (1984): Care of the Elderly: A family approach, New York, Pregaman Press.
20. Schiamberg Lawrence, B. (1985): Human Development, New York, MacMillan.
21. Sharma, M.L. and T.M. Dak (1987): Aging in India: Challenge for the Society, delhi, Janta pub.
22. Chowdhary Paul D. (1992): Aging and the aged. Inter India Pub. New Delhi.
23. Cox Harold (1984): Later life: The Reality of Aging, New Jersey, Prentice Hall Inc.
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25. Nutrition Screening Initiative (1991 and 1992): Nutrition Screening Manual for Professionals Caring for Older Americans. Washington, D.C. Green Margolis, Mitchell, Burns and Associates.
26. Chernoff, R. (ed) (1991): Geriatric Nutrition: The Health Professional's Handbook, Gaithersburg, MD: Aspen.
27. The Nutrition Screening Initiative (1994): Incorporating Nutrition Screening and Interventions into Medical Practice: A Monograph for Physicians.
28. Watson, R.R. (ed)(1985): CRC Handbook of vitamins in the Aged. CRC Press Boca Raton, Florida.
29. Bock, G.R. and Whelen, J. (eds) The Childhood Environment and Adult Disease. Chichester, U.K., Wiley.
30. Berg, R.L. and Casells, J.S. (1990): The Second Fifty Years: Promoting Health and Preventing Debility.
31. Talwar, G.P. : Textbook of Biochemistry and Human Biology.
32. B. Srilakshmi: Dietetics, New Age International (P.) Ltd. Publishers.

Journals:

1. American Journal of Clinical Nutrition
2. Gerontology
3. Journal of American Geriatric Society
4. Age Ageing
5. Journal of Applied Gerontology
6. Age
7. Journal of Gerontology

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GOVT.D.B.GIRLS'P.G.(AUTONOMOUS)COLLEGE,RAIPUR

**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc.FOOD AND NUTRITION
IVth SEMESTER
SESSION: 2020-21**

PAPER: IV

NAME OF PAPER: RESEARCH METHODS IN FOOD &NUTRITION

MAXIMUM MARKS:80

NUMBER OF UNITS:V

Unit I

1. Body Composition :-
 - (a) Normal Body Composition
 - (b) Changes through the life cycle
 - (c) Methods of Assessing body composition
2. Diet Surveys-Following factors to be considered in conducting diet surveys:-
 - (a) Trained personnel
 - (b) Population sampling
 - (c) Methods of diet surveys
 - (d) Calculation of the nutritive value of the diet in terms of adult consumption unit and interpretation.
3. Nutrition Education:-
 - (a) Training in Nutrition
 - (b) Channels of nutrition education of the community
 - (c) Nutrition education methods

Unit II

4. Design Strategies in research. (Descriptive Studies):-
 - (a) Brief Overview of Case study, Cross sectional surveys.
 - (b) Issues in the design and conduct of descriptive studies – Defining the population, defining the disease, measurement of disease, comparing with known indices, formulation of hypothesis, uses of descriptive studies.
5. Principles of Epidemiology – Definition, aims, uses, epidemiological approach

Unit III

6. Design strategies in Research – (Analytical Studies I):-
Brief overview – Case control, clinical trials.
Issues in the design and conduct of case control studies – Selection of cases. selection of controls, matching, exposure status, analysis, advantages and disadvantages.
7. Screening for Disease – Concept of screening, aims and objective,
-Types of screening ,Uses of screening,

Unit IV

8. Design Strategies in Research –(Analytical Studies II):-
 - (a) Overview of types of cohort studies.
 - (b) Issues in the design of cohort studies – Selection of exposed population, selection of comparison group, obtaining data on exposure, follow-up, analysis, advantages, disadvantages.
9. Health Information – Component of health information system, Sources of health information, Uses of Health information

Unit V

10. Experimental Studies:-
Randomized controlled trials (Clinical trials) -- Protocol, selection of reference and experimental population, randomization, manipulation, follow-up, assessment.
11. Qualitative Research-
PRA -
 - (a) Concept of PRA
 - (b) Tools and Techniques
 - (c) Evaluation

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**DEPARTMENT OF HOME SCIENCE
CLASS: M.Sc. FOOD AND NUTRITION
IVth SEMESTER
SESSION: 2020-21**

**NAME OF PAPER:DISSERTATION AND CURRENT IN FOOD& NUTRITION
PRACTICAL**

MAXIMUM MARKS:100

MINIMUM MARKS:36

(a) Dissertation:

In any field of food science, nutrition and systematic writing of report along with statistical analysis of data.

(b) Current trends in food and nutrition:

Acquaintance of the students with current trends in the field of food and nutrition
Collection and compilation of latest reviews.

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