M.Sc. in Nutrition And Food Science
Syllabus

1st Semester

Paper - 1: Basic principles of Ayurvedic Diet

A. History of Ahara Nutrition
   Vedic and Madhyayugin diet and its process

B. Basic Principal :
   What is science? What is Ayurveda

   Aharashastra – Definition, intention area of Action

   Ayurvedic composition

   Ayurvedic components

C. Details of Basic Principal :-
   Lokpirushasamya, Karyakarana Siddhanta,

   Samanya Vishesh Siddhanta,

   Panchamahabhuta Siddhanta,

   Swabhavoparmvada all Siddhanta

   In relation with diet and its importance.

D. Doshadhatumala Vidyana
   - Doshavidyana
   - Dhatuvidyana - Tissue/ Cell metabolism
   - Malavidyana - Excretary Vidyana
   - Strotovidyana – Systematic circulation
   - Dhatusarta - Cell replenishing
   - Prakruti - Constitution
   - Doshadhatumalavidyana – The importance of diet in physiological process.

Paper - 2: Principles of Nutrition

1. Definition of terms –health, Nutrition, Malnutrition, history of Nutritional Science, Scope of Nutrition, Reference Man and Reference Woman

2. Energy - Energy Balance, indirect and direct calorimetry.
3. Proteins - Protein Quality (BV, PER, NPU), Digestion and Absorption, functions, Factors affecting protein bio-availability including Anti nutritional factors. Requirements and deficiency
4. Lipids - Digestion and Absorption, requirement and deficiency- Types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, W-3)
5. Carbohydrates - Digestion and Absorption. Functions deficiency and excess. glycemic index.
6. Dietary Fibre – Classification and significance.
7. Minerals and Trace Elements - Physiological role, functions, Bioavailability and RDA and deficiencies.
8. Vitamins - Physiological role, Bioavailability and RDA and deficiencies.
9. Water - Functions, Requirements.
10. Effect of cooking on digestibility and nutritive value of foods.Improving nutritional value through different methods - germination, fermentation, combination of foods.
11. Basic principles of meal planning.
12. Nutritional considerations for planning meals for
    - Adults - male and female, different levels of physical activity.
    - Pregnancy and Lactation
    - Feeding of infants and young children 0 -3 years
    - Feeding preschool and school children
    - Feeding adolesecents
    - Old age
    - Athletes

References:

- Charaka samhita and its commentaries
- Sushruta Samhita and its commentaries
- Ashtanga Hrudaya and its commentaries
- Ashtanga Samgraha and its commentaries
- Bhavaprakash Nighantu
- YagaRatnakar
- Kshemakutuhal
- Bhojanakutuhal
- Pakadarpan – Nalakrut
- Bruhan-nighanturatnakar
- Madhav Dravyaguna – Priyavrat Sharma

- Guthrie H.: Introductory Nutrition (6th ed.) Times Mirror/Mostry College Publishing, 1986
- Robinson, Lawler: Normal & Therapeutic Nutrition (17th ed.) Macmillan Publishing Co. 1986.

- Swaminathan S.: Advanced textbook on food & nutrition Vol. 1 & n (2nd ed. Revised _ enlarged) Bapp Co. 1985.
- Robinson. Basic Nutrition and Diet Therapy (8th edition)
- Shills and Young. Modern Nutrition in Health and Disease.

Paper - 3: Concept of Preventive Ayurvedic Diet & clinical Physiology

A. Concept of Preventive Ayurvedic Diet

- Definition of swasthya, Deha (Body), Prevention and maintenance of health through diet
- Dinacharya (Daily regime), Rutucharya (Seasonal conduct)

- Daily regimen and seasonal conduct applied aspect health definition,BMI,BMR ,aphometery

- Bhojana vidhi

- Jalapana

- Patra concept
- Laghana therapy

- Classification of dietary element basics of varga

B. Clinical Physiology:-

1. Introduction – cell, cell structure, cellular organelles and their functions
2. The Skeletal system
3. The Muscular System - Types of muscles, characteristics, Similarities and Differences.
4. Blood and Circulatory System - Blood and its composition, Functions of each constituent of blood, Blood groups, Blood transfusion and its importance, Coagulation of blood, Blood vessels, Structure and functions of heart, Blood pressure, heart rate, Cardiac output and their regulation.
5. Lymphatic System - Lymph, Lymph glands and its functions, Spleen - Structure and Functions.
6. Respiratory System - Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration.

7. Digestive System - Structure and Functions of Alimentary tract. Functions of various secretions and juices - Saliva, Gastric, Bile, Intestinal, Pancreatic. Functions of enzymes involved in digestion. Digestion of nutrients - Proteins, Fats, Carbohydrates..
8. Excretory System - Structure and Functions of (a) Kidney (b) Ureter (c) Bladder (d) Skin. Urine -Formation of urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature.
9. Nervous System - Structure of Nerve Cell, Fibre, Classification of Nervous System, CNS - Brain, Lobes of brain, Cerebrum, Cerebellum, Medulla oblongata, Hypothalamus. Pituitary Gland - structure, Functions, Spinal Cord - structure and functions, Autonomic and Sympathetic nervous system.
10. Reproductive System – Femaleand male reproductive system - organs, structure and functions . Menstrual cycle, Puberty, Menarche, Menopause, Fertilization of ovum, Conception, Implantation.
11. Sense Organs - Eye ,Ear, Skin -structure and function
12. Glands and Endocrine System -
    - Liver and gall bladder- structure and function
    - Enterohepatic circulation
    - Pancreas - structure and function
    - Endocrine glands - structure and function. Hormone - types and functions, role in metabolism. Endocrine disorders
    - Regulation of Hormone Secretion

References:

- Charaka samhita and its commentaries
- Sushruta Samhita and its commentaries
- Ashtanga Hrudaya and its commentaries
- Ashtanga Samgraha and its commentaries
- Bhavaprakash Nighantu
- YagaRatnakar
- Kshemakutuhal
- Bhojanakutuhal
- Pakadarpan – Nalakrut
- Bruhan-nighanturatnakar
- Madhav Dravyaguna – Priyavrat Sharma
- Guyton
- Ross and Wilson

Paper - 4: Ayurvedic Food Science & Clinical Bio-Chemistry

A. Aahar, Guna, Karma, Matra & Compatibility:-

Basics of Dravyaguna

Dravya

Karma

Rasa

Krutanna Varga & Sanskar Vichar:-

Manada
Peya
Vilepi
Yavagu
Odana
Misshtanna

B. Clinical Biochemistry:-

1. Introduction to Biochemistry - Significance of pH, Acid-Base Balance,
2. Carbohydrates - Structure and properties of Mono-saccharides, Di-saccharides, Poly-saccharides. Study of metabolism of carbohydrates, Glycolysis, Aerobic, Anaerobic, TCA, Significance of TCA cycle integrating metabolism of carbohydrates protein and lipid, Gluconeogenesis, Glycogenesis, Glycogenolysis, HMP shunt.
3. Proteins - Structure, composition Classification and Function, Structure of important proteins with special reference to Insulin, myoglobin, and hemoglobin, Binding proteins and their functions - nutritional implications, Chemistry of amino acids, Metabolism of Proteins and amino acids - Build up of amino acid pool. Urea Cycle, Creatinine and Creatine Synthesis, changes in PEM, Pregnancy, Inborn errors of metabolism.
4. Lipids - Definition, Composition, Classification, Structure and Properties, Lipoproteins, Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of ketone bodies, Biosynthesis of fatty acids, Phosphoglycerides, Biosynthesis of cholesterol and regulation, Bile acids and their metabolism, Plasma lipoproteins - Synthesis and Metabolism, Biochemical profile, alterations and significance, Prostaglandins.Role of carnitine in lipid metabolism
5. Enzymes and hormones- Definition, Classification specificity of enzymes - Intracellular distribution, kinetics, inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis.Inborn errors of metabolism.
6. Biological Oxidation, Electron Transport Chain, Oxidative Phophorylation.

References:

- Sushrut Samhita
- Charak Samhita
- Vagbhat

- Lehninger, A. L., Principles of Biochemistry
- Dasgupta, S. K., Biochemistry Vol. I; n & III, Mc Millan Co. of India Limited
- satyanarayananU, 2006 Biochemisry, 3rd edition, Uppala Author Pub.

Exam Pattern:-

Paper 1, 2 , 3 and 4	40 Marks each for Internal Assessment 60 marks each for each paper
Practical/Viva	20 Marks for Internal Assessment 30 Marks for Practical/Viva Voce

2nd Semester

Paper -1: Classification of Aahariya Dravya & Diet Counseling

1. A. Varga Vichar, Anukta Varga:-

Varga Vichar:-

- Shukavarga
- Shimbivarga
- Shakavarga
- Lavanavarga
- Dugdhavarga
- Mansavarga
- Tailavarga
- Phalavarga
- Madhuvarga
- Jalavarga

Anukta Varga:-

- Tea
- Coffee
- Preserved Food
- Ice cream
- Bakery product

B. DIETETIC COUNSELING

- Dietitian as part of Medical Team and outreach services.
- Clinical Information- Medical History and patient profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, stress, Nutritional status. Correlating Relevant Information and identifying areas of need.
- The care process – Setting goals and objectives short term, Counselling and Patient Education, Dietary prescription.
- Motivating Patients.
- Working with
  - A. Hospitalized patients (adults, pediatric, elderly and handicapped) adjusting and adopting to individual needs.
  - B. Outpatients (adults, pediatric, elderly and handicapped) patient's education, techniques and modes.

- Follow up, Monitoring and Evaluation of outcome , Home visits

Paper -2 : Medical Nutrition Therapy- Part I

1. **Nutritional Intervention - Diet Modifications**

   - Adequate normal diet as a basis for therapeutic diets
   - Diet Prescription
   - Modification of Normal Diet
   - Nomenclature of Diet Adequacy of Standard Hospital Diets
   - Psychological factors in feeding the sick person

2. **Interactions between Drugs, Food Nutrients and Nutritional Status**

   - Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements.
   - Drugs affecting intake of food and nutrients
   - Absorption
   - Metabolism and excretion
   - Effect of food, nutrients and nutritional status on absorption and metabolism of drugs
   -

2. **Disease of the G. I. System** -
   - Pathogenesis of G.I.
   - Diseases of esophagus and dietary care
   - Diseases of stomach and dietary care
   - Gastric and duodenal ulcers
   - Predisposing factors and Treatment
   - Brief medical therapy, rest, antacids, other drugs and dietary care
   - Food acidity, foods that cause flatulence, factors that damage G. I. Mucosa
   - Foods stimulating G. I. Secretion
   - Gastrectomy
   - Intestinal Diseases
   - Flatulence, Constipation, Irritable Bowel, Hemorrhoids,. Diarrhoea, Steatorrhoea, Diverticular disease, Inflammatory Bowel Disease, Ulcerative Colitis.
   - Treatment and Dietary Care
   - Malabsorption Syndrome
   - Celiac Sprue, Tropical Sprue
   - Intestinal Brush border deficiencies (Acquired Disaccharide Intolerance)
   - Protein Losing Enteropathy
   - Dietary Care Process

- **Pathophysiology of GI tract diseases - anatomic, physiologic and functional changes, impact on nutritional status and nutritional implications, post surgical complications and management, malabsorption syndrome.**

3. **Diet in Diseases of the Liver, Pancreas and Biliary System**
    - Nutritional care in Liver disease in the context of results of specific Liver Function Tests.
    - Dietary Care & Management in Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalophathy, Wilson's disease.
    - Dietary care and management in diseases of Gall Bladder and Pancreas.
    - Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis
    - **Pathophysiology of liver diseases - Progression of liver disease metabolic and nutritional implications, role of specific nutrients and alcohol.**
    - **Diseases of the Gall Bladder and Pancreas - Pathophysiologic changes - metabolic and nutritional implications, Dyslipidemias.**

4. **Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycemia**
    - Classification
    - Physiological symptoms and disturbances, diagnosis (FBG and OGTT)
    - Management of Diabetes Mellitus
    - Hormonal Therapy
    - Oral Hypoglycemic Agents
    - Glycosylated Hemoglobin
    - Urine Testing
    - Exercise
    - Dietary care and Nutritional Therapy - The Diet Plan, Meal planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes
    - Gestational DM, IDDM and NIDDM, Diabetic diets in Emergency, Illness, Diabetic coma, Insulin reaction, Juvenile diabetes, Patient Education in Diabetes
5. **Hypoglycemia** -classification, symptoms, fasting state hypoglycemia, Postprandial or reactive hypoglycemia.
6. **Dietary care in diseases of the Adrenal Cortex, Thyroid gland and Parathyroid gland.**
    - Functions of the gland and hormones and their insufficiency, metabolic implications, clinical symptoms.
    - Dietary treatment as supportive to other forms of therapy

- Adrenal cortex insufficiency, Hyper and Hypothyroidism (goitre), Hypoglycemia.

7. Nutritional care for Weight Management

- Regulation of energy intake and balance of body weight
- Control of appetite - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
- Types of obesity, Health risks
- Theories of obesity, Physiology of the obese state
- Thermogenesis, Thyroid hormones
- Treatment of Obesity
- Evaluation of some common diets, Protein-sparing modified fast, High protein diet
- Behavioural Modification - Psychotherapy, pharmacology, exercise & physical activity, Surgery, prevention of weight gain & obesity.
- Underweight - Etiology and Assessment, High calorie diets for weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia
- **Metabolic Disorders, Diseases of Endocrine Glands and Inborn Errors of Metabolism. Diabetes, Hyper and Hypothyroidism, Inborn errors of carbohydrate and protein metabolism.**
- **Regulation of Food intake and Pathogenesis of Obesity and Malnutrition and Starvation.**

9. Diseases of the Circulatory System

- Atherosclerosis - Etiology, risk factors, diet
- Hyperlipidemias .
- Clinical and nutritional aspects of Hyperlipidemias
- Classification and Dietary care of Hyperlipidemias
- Nutritional care in Cardiovascular disease (Ischemic heart disease Pathogenesis of sodium and water retention in Congestive Heart Disease. Acute and Chronic Cardiac Disease, Acute - Stimulants, food & consistency, Chronic - Compensated and decompensated states, Sodium Restriction in Cardiac Diseases, Diet in Hypertension - Etiology, Prevalence, Renin-Angiotensin mechanism, Salt and Blood pressure, Drugs and Hypertension, Cerebrovascular diseases and diet in brief).
- **Cardio-vascular Diseases - Pathogenesis, role of nutrients in prevention - metabolic and nutritional implications, Dyslipidemias.**

10.Anemia

- Resulting from Acute Hemorrhage
- Nutritional anemia
- Sickle cell anemia
- Thalassemia
- Pathogenesis and dietary management in the above conditions

11.Renal Disease

- Physiology & function of normal kidney - a brief review
- Diseases of the kidney, classification

- Glomerulo nephritis - Acute and Chronic - Etiology, Characteristics, Objectives, Principles of Dietary Treatment and Management
- Nephrotic syndrome - objectives, principles of Dietary Treatment and Management.
- Uremia and Renal Failure

- Acute Renal Failure - Causes, dietary management fluid, sodium and potassium balance, protein and energy requirements
- Chronic renal failure medical treatment, Renal transplants. Dialysis and types hemodialysis, Peritoneal Dialysis & Continuous Ambulatory Peritoneal Dialysis (CAPD). Dietary Management in conservative treatment, dialysis and after renal transplantation.
- Use of Sodium and Potassium Exchange lists in Renal
- Chronic renal failure in patients with diabetes mellitus
- Chronic renal failure in children
- Nephrolithiases /kidney stone- Etiology, types of stones, Nutritional care, alkaline-ash diets
- **Diseases of the renal system - etiology and pathogenesis - changes in function with progression of diseases, metabolic and nutritional implications, water and electrolyte balance.**

12. Allergy

- Definitions, symptoms, mechanism of food allergy
- Diagnosis - History, Food record
- Biochemical and Immunotesting (Brief)
- Elimination diets
- Food selection
- Medications (brief)
- Prognosis food Allergy in infancy - Milk sensitive enteropathy; Colic, Intolerance to breast milk, prevention of Food Allergy.

- **Immunity and infection - diarrhea, AIDS, Respiratory problems.**

13. Diseases of Nervous System, Behavioural Disorders and Musculo Skeletal System

- Neuritis and polyneuritis
- Migraine, headache
- Epilepsy
- Multiple sclerosis
- Hyperkinetic Behaviour Syndrome
- Orthromolecular psychiatry and mental illness (Brief) Definition, etiology, dietary treatment and prognosis in the above conditions.
- Arthritis –
- Rheumatoid Arthritis
- Osteoarthritis
- Symptoms, dietary management
- **Musculo-skeletal problems, arthritis, osteoporosis.**

14. Nutrition in Cancer

- Types, symptoms, detection
- Cancer therapies and treatment - side effects and nutritional implications
- Goals of care and guidelines for oral feeding
- Accommodating side effects
- Enteral tube feeding - Nasogastric, Gastrostomy, Jejunostomy
- Parenteral Nutrition
- Pediatric patients with cancer
- The terminal cancer patient
- **Cancer - carcinogenesis - pathogenesis and progression of cancer, role of nutrients, foodstuffs and food additives in cancer. Therapies and their clinical and metabolic implications.**

15. Nutrition in Physiological Stress

- Physiological stress and its effect on body, nutritional implications.
- Fevers and infections
- **Stress and Physiologic effects.**
- Surgery and Management of Surgical Conditions
- Parenteral Nutrition - Types, mode, and composition of feeds
- Tube feeding - Routes, modes, composition, care to be taken during feeding
- Dietary guidelines

- Burns
- Metabolic implications - nutritional requirement
- Management and nutritional care
- Nutritional Management of Patients with HIV, AIDS
- **Normal cellular processes, Injury and response of cells to injurious agents, Cellular adaptations**

References:

- Charaka samhita and its commentaries
- Sushruta Samhita and its commentaries
- Ashtanga Hrudaya and its commentaries
- Ashtanga Samgraha and its commentaries
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- Bhojanakutuhal
- Pakadarpan – Nalakrut
- Bruhan-nighanturatnakar
- Madhav Dravyaguna – Priyavrat Sharma
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A. Antia F. P.: Clinical Dietetics and Nutrition, 3rd ed., Oxford University, Press, Delhi, Reprinted in 1989.
B. Robinson, C. H, M. R. Lawlwr, W. L. Chenoweth and A. E. Garwick: Normal and Therapeutic Nutrition, 17th ed;, Mac Millan Pub. Co.
C. Krause. Food, Nutrition & Diet Therapy.
D. Shills and Young. Modern Nutrition in Health and Disease

Paper - 3: Microbiology & Research Methodology

3. A. Microbiology:-

1. Study of morphology, cultural characteristics and biochemical activities of Mold, Yeast, Bacteria, Viruses, Protoz oa Important microorganisms in foods industry.
2. Growth curve of a typical bacterial cell - Effect of intrinsic and extrinsic factors on growth of organisms, pH, water activity, 0- R potential, nutritional requirements, temperature, relative humidity and gaseous environment.
3. Primary sources of micro-organisms in foods - Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization.
4. Fundamentals of control of micro-organisms in foods - Extrinsic and intrinsic parameters affecting growth and survival of organisms. Use of high and low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation, and use of preservatives in food. Storage of food-correct handling and

techniques of correct storage, Temperatures at which growth is retarded and bacteria are killed, Storage temperatures for different commodities to prevent growth or contamination and spoilage.

5. Food spoilage and contamination in different kinds of foods and their prevention - Cereal and cereal products, pulses and legumes, Vegetables and fruits, Meat and meat products, Eggs and poultry, Milk and milk products.
6. Public health hazards due to contaminated foods - Food poisoning and infections - Causative agents, symptoms, sources and mode of transmission, foods involved, Method of prevention, Fungal toxins, Investigation and detection of food-borne disease outbreak.
7. Microbes used in biotechnology - Useful micro-organisms, Fermented foods - raw material used, organisms and the product obtained, Benefits of fermentation.
8. Indices of food, milk and water sanitary quality. Microbiological criteria of food, water and milk testing. Food standards, PFA, FPO, BNS, MPO, Agmark, Codex Alimentarius.
9. Hygiene and its importance and application - Personal hygiene - care of skin, hair, hands, feet, teeth, Use of cosmetics and jewellery, Grooming, Uniform, Evaluation of personal hygiene, Training staff.
10. Safe handling of food - Control measures to prevent food borne diseases and precautions to be taken by food handlers. Reporting of cold, sickness, boils, septic wounds etc.
11. Rodents and Insects as carriers of food-borne diseases. Control techniques.
12. Disinfectants, sanitizers, antiseptic and germicide. Common disinfectants used on working surfaces, kitchen equipment, dish washing, hand washing etc. Care of premises and equipment, cleaning of equipment and personal tools immediately after use, use of hot water in the washing process.
13. Waste disposal, collection, storage and proper disposal from the premises.
14. Legal administration and quality control, laws relating to food hygiene.

3. B. Research Methodology:-

Definition, Types – Ancient Research Methodology, Modern research methodology, Ayurvedic research aspect & importance statistics, Basics of dissertation

Paper 4: Basic Diet from Kshemkutuhal & Bhojankutuhal

4. A. Kshemkutuhal

4. B. Bhojankutuhal

Exam Pattern:-

Paper 1, 2 , 3 and 4	40 Marks each for Internal Assessment 60 marks each for each paper

Practical/Viva	20 Marks for Internal Assessment 30 Marks for Practical/Viva Voce

3rd Semester

Paper – 1: Ayurvedic Nutrition Therapy & Hospital Catering Management

1. A. Method of Nidan in Ayurved:-

Vyadhi Utpatti, Rogamarga, Shatkriyakal

1. Vyutpatti, Definition, Nidan Panchak, Characteristics of Ayurvediya Nidan, Vyadhi Utpatti
2. Aamotpatti, Trayo Rogamarga, Hetubhootatva of Aahar in Rogotpatti
3. Shatkriyakal according to Sushruta, its importance in Nidan
4. Roga- rogi Parikshan

Srotonurupa Aahariya Hetu :-

1. Pranavaha Srotas	-	Shwas
2. Annavaha	-	Ajirna
3. Udakavaha	-	Shotha
4. Rasavaha	-	Hridroga
5. Raktavaha	-	Kamala
6. Mamsavaha	-	Karshyadi
7. Medovaha	-	Santarpanotha – Sthaulya
8. Asthivaha	-	Sandhigata Vata
9. Majjavaha	-	Bhram etc.
10. Shukravaha	-	Klaibya
11. Purishvaha	-	Atisar
12. Mutravaha	-	Ashmari
13. Swedavaha	-	Kushtha
14. Manovaha	-	Unmad
15. Sadnyavaha	-	Murchha

B. Hospital Organisation & Personal Management

1. Introduction to food services and catering industry, Development of food service institutions in India, Types of services as affected by changes in the environment.
2. Hospital food service as a speciality – Characteristics, rates and services of the food production, service and management in hospitals. Role of the food service Manager/Dietitian.
3. Organisations – Types of organizations and characteristics. Organizational charts.

4. Catering Management – Definition, Principles and functions, Tools of Management Resources. Attributes of a successful manager. Leadership, motivation and communication. Dietitian as leader.
5. Approaches to Management Traditional, Systems Approach, Total Quality Management.
6. Management of Resources- Capital, Space, Equipment and furniture, Materials, staff, Time and Energy, Procedures Physical facility design and planning. Equipment selection.
7. Purchase and store room management – Purchase systems, specifications, food requisition and inventory systems, quality assurance.
8. Human Resource Management

1. Definition, Development and policies
2. Recruitment selection, Induction
3. Employment procedures: Employee Benefits, Training and Development, Human Relations, Job descriptions, Job evaluation, Personnel appraisal.
4. Trade Union Negotiations and Settlement.

9. Financial Management – Elements of Financial management, Budget Systems and accounting. Budget preparation.
10. Laws- food laws, labor laws/IDA Board / Membership /Contact Us

References:

1. Food Service mgt West, B. B. and wood, L (1979) food service in illustrations John willey, Newyork Sethi, MMalhan 1997 catering management An integrated approach new age international
2. Charaka samhita and its commentaries
3. Sushruta Samhita and its commentaries
4. Ashtanga Hrudaya and its commentaries
5. Ashtanga Samgraha and its commentaries
6. Bhavaprakash Nighantu
7. YagaRatnakar
8. Kshemakutuhal
9. Bhojanakutuhal
10. Pakadarpan – Nalakrut
11. Bruhan-nighanturatnakar

12. Madhav Dravyaguna – Priyavrat Sharma

Paper – 2: Ayurvedic Nutrition in Obstratics & Pediatrics

A. Strotsanusar Vyadhi Aharchikitsa in special condition like Koumarbhritya, garbhini, sutika, etc. Avastha , Pathyapathya, Desha, and Anupana

1. Ahara according to specific Avastha, - Ritumati, Rajasvala, Garbhini, Sootika, Rajinivrutta, Agewise (Navajaata to Vriddha)
2. Pathyapathya for Swasthya Rakshan – Significance and importance.
   Anna – prakriti- Swastha avastha aahar.

   Definition of Pathya, Types (according to Anna, Aushadh, Vihar, Vidhi)
3. Desh Vichar, Typesa, Dietary Habits, Food items according to Desh, Variation in Ahar in Maharashtra based on regions.
4. Anupan – Properties of Samyak Anupana, Contraindications, Anupana Dravya, Kala, according to Ritu (season) and Vyadhi.
   Jala – Pathyapathya Vichar

B.Pediatric Nutrition:-

1. Pregnancy and lactation – changes in physiology, Nutritional requirement Physiology of lactation and maternal nutrient needs
2. Requirement of Neonates, weaning and current feeding practices
3. Nutritional requirement of premature infants their growth and development
4. PEM and childhood obesity
5. Common problems in infancy – diarrhea, constipation, milk intolerance, celiac disease.
6. NIDDM in born errors in metabolism.

Paper- 3: Ayurvedic Nutrition Therapy -Part II

A. Strotsanusar Vyadhi Aharchikitsa in adults:-

1. Pranavaha Srotas - Shwas

2. Annavaha	-	Ajirna
3. Udakavaha	-	Shotha
4. Rasavaha	-	Hridroga
5. Raktavaha	-	Kamala
6. Mamsavaha	-	Karshyadi
7. Medovaha	-	Santarpanotha – Sthaulya
8. Asthivaha	-	Sandhigata Vata
9. Majjavaha	-	Bhram etc.
10. Shukravaha	-	Klaibya
11. Purishvaha	-	Atisar
12. Mutravaha	-	Ashmari
13. Swedavaha	-	Kushtha
14. Manovaha	-	Unmad
15. Sadnyavah	-	Murchha

B. Geriatric Nutrition:

Physiological changes in aging.
Nutritional requirements
Health problems
Drug & Nutrient interaction

Paper 04 : Medical Nutrition Therapy Part II

4.Advance Dietetics:-

1.Normal cellular processes, Injury and response of cells to injurious agents, Cellular adaptations

2.Stress and Physiologic effects.

3.Regulation of Food intake and Pathogenesis of Obesity and Malnutrition and Starvation.

4.Pathophysiology of GI tract diseases - anatomic, physiologic and functional changes, impact on nutritional status and nutritional implications, post surgical complications and management, malabsorption syndrome.

5.Pathophysiology of liver diseases - Progression of liver disease metabolic and nutritional implications, role of specific nutrients and alcohol.

6.Diseases of the Gall Bladder and Pancreas- Pathophysiologic changes - metabolic and nutritional implications, Dyslipidemias.

7.Cardio-vascular Diseases - Pathogenesis, role of nutrients in prevention - metabolic

and nutritional implications, Dyslipidemias.

8.Diseases of the renal system - etiology and pathogenesis - changes in function with progression of diseases, metabolic and nutritional implications, water and electrolyte balance.

9.Metabolic Disorders, Diseases of EndocrineGlands and Inborn Errors of Metabolism.

Diabetes, Hyper and Hypothyroidism, Inborn errors of carbohydrate and protein metabolism.

10.Cancer - carcinogenesis - pathogenesis and progression of cancer, role of nutrients, foodstuffs and food additives in cancer. Therapies and their clinical and metabolic implications.

11.Immunity and infection - diarrhea,AIDS, Respiratory problems.

12.Musculo-skeletal problems, arthritis, osteoporosis

Exam Pattern:-

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Practical/Viva	20 Marks each for Internal Assessment 30 Marks each for Practical/Viva Voce

4th Semester

Paper -1 : Community Nutrition

A. Community Nutrition:-

1. Concept and Scope of Community Nutrition.
2. Food availability and factors affecting food availability and intake. Agricultural production, post harvest handling (storage & treatment), marketing and distribution, industrialization, population, economic, regional and socio-cultural factors. Strategies for augmenting food production.
3.
    a. Assessment of Nutritional status - meaning, need, objectives and importance. Use of clinical signs, anthropometry, biochemical tests, and biophysical methods. Assessment of food and nutrient intake through recall, record, weighment.
    b. Food security and adequacy of diets.
4. Use of other sources of information for assessment.
    a. Sources of relevant statistics.
    b. Infant, child and maternal mortality rates.
    c. Epidemiology of nutritionally related diseases.
5. Nutritional problems of communities and implications for public health. Common Nutritional Problems in India.
    a. PEM
    b. Micronutrient Deficiencies
    c. Fluorosis
    d. Correction/Improvements in Diets
6. Schemes and Programs in India to combat Nutritional Problems in India. Role of International, National and Voluntary agencies and Government departments.
7. Hazards to Community Health and Nutritional status
    a. Adulteration in food
    b. Pollution of water, air
    c. Waste management
    d. Industrial effluents, sewage
    e. Pesticide residue in food
    f. Toxins present in food - mycotoxins etc.

8. Health and Nutrition Education - Steps in planning, implementation, and evaluations. Use of educational aids - visual, audio, audio-visual, traditional media etc.

Paper-2 : Ayurvedic Diet Planning

A. Case Study

Case study : Aharia hetu,samprapti aharia hetu basis,parishana and aharia hetu and aharia chikitsa

B. Regional, Continental & International dietary practices with Ayurveda perspective

Paper- 3: Sports Nutrition & Fitness Nutrition

A. Sport Nutrition:-

- Diet & Sports performance
- Body composition & Anthropometry
- Sports psychology
- Doping
- Sports injuries.

B. Fitness Nutrition

- Introduction to fitness & training benefits of exercise
- Substrate of exercise
- Effect of specific Nutrient on work performance & Physical fitness and training diets.
- Formulating dietary guidelines.

Paper – 4: Dissertation:

Paper 1, 2 3	60 marks each
Dissertation	100 marks
Practical	50 marks