SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

CHOICE BASED CREDIT SYSTEM

Syllabus For

Post Graduate Diploma

in

Nutrition and Dietetics

SEMESTER I AND II

(Syllabus to be implemented from June, 2022 onwards.)

P.G. Diploma In
Nutrition and Dietetics 2022-23
Choice Based Credit System

1. Preamble-

Nutrition and Dietetics is a subject of growing importance in many aspects of healthcare, lifestyle and industry. It focuses on the interface between human nutrition and health; an area of increasing importance to the health educators, health promoters, health departments, food industry and consumers. It builds on major concepts of biochemistry, human physiology, human nutrition and therapeutic nutrition to discuss the roles of all nutrients of food and its role in health and disease. The P.G. Diploma in Nutrition and Dietetics includes study of human physiology, biochemistry, medical nutrition therapy, community nutrition, human nutrition, food service management, food microbiology, research and evaluation.

2. Nomenclature of the Degree:

The nomenclature of the degree awarded shall be Post Graduation Diploma in Nutrition and Dietetics.

3. Eligibility for Admission:

The eligibility for admission to the P. G. Diploma Programme in Nutrition and Dietetics shall be B.Sc. Home Science (Food and Nutrition), B.Sc. Home Science (General), Bachelor of Food Technology and Management, B.Sc. (Food Technology and Management), B.Sc. (Food Processing and Quality Control), B.Sc. (Food Science), B. Voc. (Food Processing and Management) with 12^{th} Science, B. Tech. (Food Technology), B.Sc.(Food Science and Quality Control), B.Sc. (Biochemistry/ Chemistry/ Micribiology/ Biomedical Sciences/ Biotechnology/ Life Sciences/ Zoology/ Botany/ Hotel Management) or equivalent, MBBS, BAMS, BHMS, B. Pharmacy, B. Physiotherapy.

4. Intake capacity:

The intake capacity is 30 students.

5. Duration to complete the Program:

The candidate who fails to complete the program within a period of one academic year should complete the program within Three years from the date of joining the program.

6. Attendance:

A candidate shall not be allowed to appear for the final examination of the University unless she/he has kept a term in the college and produces a certificate from the Principal of the college.

a) Of having completed the minimum units in theory and practical as prescribed in the syllabus.

Of having attended 80% of the total period devoted to Practical/orals/seminar/displays/workshop/project work and other related activities.

b) Of having submitted the required no. of tutorials seminars and assignment.

Standard of Passing

Standard Passing will be according to CBCS guidelines.

STAFF REQUIREMENT AND QUALIFICATION

Staff		Qualification
Assistant Professor	-	A) Master of Science (MSc.) with Specialization in the following 1. Nutrition and Dietetics 2. Clinical Nutrition 3. And Equivalent degrees B) The minimum requirements of a good academic record, 55% marks (or an equivalent grade in a point scale wherever grading system is followed) at the master's level and qualifying in the National Eligibility Test (NET), or an accredited test (State Level Eligibility Test - SLET/SET), shall remain for the appointment of Assistant Professors.

PROGRAM OUTCOMES (POS), PROGRAM SPECIFIC OUTCOMES (PSO)

PROGRAM OUTCOMES (POS)	1. Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes. Students will be able to prepare and deliver effective presentations of technical information to nutrition and dietetics professionals and to the general public/community. 2. Students/ learners will gain a broad knowledge of food focusing on human nutrition, biochemistry, and physiology whilst giving them the necessary understanding of food quality, safety and hygiene to excel in the field. 3. Students/ learners will develop an in-depth understanding of the principles that underpin the relationships between diet, human health and wellbeing. 4. Ability development of Students/ learners to critically appraise the effects of safe food preparation, storage and handling with respect to food microbiology and food service management.

PROGRAM SPECIFIC OUTCOMES (PSO)	1. Able to provide nutrition counselling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies. 2. Able to apply technical skills, knowledge of health behaviour, clinical judgment, and decision-making skills when assessing and evaluating the nutritional status of individuals and communities and their response to nutrition intervention. 3. Students can implement strategies for food access, procurement, preparation, and safety for individuals, families, and communities. Apply food science knowledge to describe functions of ingredients in food. 4. Students/ learners will develop the ability to apply fundamental specific concepts to understand the complex characteristics of foods. 5. The programme will allow the students to challenge current issues in food microbiology and issues arising from food safety. 6. The programme will encourage students to evaluate current issues and developments related to the Nutrition and Dietetics discipline.

P. G. Diploma in (Nutrition and Dietetics) (CBCS Pattern)P.G.D.N.D. Part I Course Structure

Semester I (Duration Six Months)													
TYPE	**SR. NO**	**COURSE CODE**	**TITLE OF THE PAPER**	**TEACHING SCHEME**			**EXAMINATION SCHEME**					
				Theory and Practical			**External Assessment (EA)**			**Internal Assessment (IA)**		
				LECTURES (per week)	**HOURS (per week)**	**CREDITS**	**Max. Marks**	**Min. Marks**	**Exam. Hours**	**Max. Marks**	**Min. Marks**	**Exam. Hours**
CGPA	1	CC-101	Human Physiology	03	03	03	80	32	3	20	8	1
	2	CC-102	Biochemistry	03	03	03	80	32	3	20	8	1
	3	CC-103	Human Nutrition and Meal Management	03	03	03	80	32	3	20	8	1
	4	CC-104	Medical Nutrition Therapy-1	04	04	04	80	32	3	20	8	1
	5	CCPR-105	A) Laboratory Course I	-	08	04	80	32	3	20	8	1
			B) Project Phase I	-	08	04	80	32	3	20	8	1
Total(A)				---	---	21	480	---	---	120	---	---
Non-CGPA	1	AEC-106	Communication English	02	02	02	---	---	---	50	20	2
Semester II (Duration Six Months)												
CGPA	1	CC-201	Medical Nutrition Therapy-2	04	04	04	80	32	3	20	8	1
	2	CC-202	Food Microbiology, Hygiene and Safety	03	03	03	80	32	3	20	8	1
	3	CC-203	Community Nutrition	03	03	03	80	33	3	20	8	1
	4	CC-204	Food Service Management	03	03	03	80	32	3	20	8	1
	5	CCPR-205	A) Laboratory Course II	-	08	04	80	32	3	20	8	1
			B) Project Phase II	-	08	04	80	32	3	20	8	1
Total (B)				---	---	21	480	---	---	120	---	---
Non-CGPA	1	SEC-206	Fundamentals of Information Technology	2	2	2	---	---	---	50	20	2
Total (A+ B)						42	960	---	---	--	---	---

Hospital Internship:

The duration of the Program shall be one academic year followed immediately by 2 months Internship in Multi-specialty Hospitals. No candidate who has passed the examination shall be awarded the Diploma unless she has undergone the Internship in an Institution For a period of at least two months in hospitals. Students are expected to collect five case histories and submit a report.

EXAMINATION PATTERN

Theory: - 100 Marks

External Assessment: - 80 Marks

Internal Assessment: - 20 Marks

Nature of Theory Examination

Objective Questions: 10 Marks

- Fill in the blanks.
- Match the following.
- True or False.
- Explain the term.

Short Notes: 20 Marks

Subjective Questions: 50 Marks

Solve any five questions out of seven.

Nature of Practical Examination

Practical Paper: 100 Marks

- Journals: 10 Marks
- Viva: 10 Marks
- Experiment: 80 Marks

Project Work 100 Marks

- External assessment 75 Marks
- Internal assessment 25 Marks

CC- 101 HUMAN PHYSIOLOGY **(3 Credits: 45 Contact Hrs.)**

Course Outcome

- Students will understand structure and function of cell, tissues and organs of the body
- Students will come to know about different systems of the body and their functions
- Students will learn the role of body systems in maintaining Homeostasis

UNIT 1 **(1 Credit: 15 Contact Hrs.)**

- General principles of physiology
- The Skeleton- General Account
- The Muscular System- General Account- Types of muscles, Characteristics, Similarities and Differences.
- Endocrine System- Liver: Structure and Function, Gall Bladder: Structure and Function, Entero-hepatic Circulation, Pancreas: Structure and Function, Endocrine glands: structure, function, hormone, types, role in metabolism, Regulation of Hormone secretion.
- Blood and Circulatory System- Blood and its composition, Functions, 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
- Lymphatic System- Lymph, Lymph Glands and functions, Spleen- Structure and Functions.

UNIT 2 **(1 Credit: 15 Contact Hrs.)**

- Respiratory System- Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration
- Digestive System- Structure and Functions of Alimentary Tract, Functions of various secretions and juices- Saliva, Gastric, Bile, Intestinal, Pancreatic. Functions of enzymes in digestion. Digestion of nutrients- Proteins, Fats, Carbohydrates.
- Excretory System- Structure and Functions of: Kidney, Ureter, Bladder, Skin. Urine: Formation of Urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature.

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Nervous System- Structure of Nerve Cell, Fibre, Classification of Nervous System,

  Central Nervous System- Brain, Lobes of Brain, Cerebrum, Cerebellum, Medulla Oblangata, Hypothalamus, Pituitary Gland- Structure, functions, Spinal cord- structure and functions, Autonomic and Sympathetic nervous system.

- Reproductive System- Female Reproductive System: organs, structure and functions, Male Reproductive System: Structure and functions, Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization of ovum, conception, implantation, methods of contraception.

References:-

1. L Antony, C.A (1963), 'Text Book of Anatomy and Physiology', the c.v. Moshy Co., Saint Louis
2. Bell G.H., Davidson, J.N., and Scarborough H. (1972) 'Textbook of Physiology and Biochemistry' London E.S. Livingston Ltd.
3. Best. C.H., and Taylor, R. B. (1965) 'The Living Body', London, Chapman & Hall Ltd.
4. Best. c.H., and Taylor. R.B. (1975), 'The Physiological Basis for Medical Practice' Calcutta, The Williams and Wilkinson Scientific Book Agency.
5. Guytons, AC. (1966), 'Text book of Medical Physiology', London, W.B. Saundes & Co.
6. Rogers, T.S, Elementary (1961), 'Human Physiology', New York, John Willey and Sons, Inc.7. Green, H.(1972), 'An Introduction to Human Physiology' London, Oxford University Press
7. K Sembulingam, Prem Sembulingam. Essentials of Medical Physiology

CC-102 BIOCHEMISTRY **(3 Credits: 45 Contact Hrs.)**

Course Outcome

1. Students will gain understanding in physiological and metabolic functions of nutrients

2. Students will be able to know the significance of biochemical pathways in nutrient metabolism.
3. Students will be able to understand the regulatory mechanisms of macronutrient metabolism
4. Students will learn the nutrition-related disorders.

UNIT 1 **(1 Credit: 15 Contact Hrs.)**

- Introduction to Biochemistry- Significance of Ph, Acid-Base Balance, Cell Structure, Composition, Organells, Membrane and Functions- Alterations and Significance.
- Carbohydrates- Structure and Properties of Mono-saccharides, Di-saccharides, Polysaccharides, Study of intermediary metabolism of carbohydrates, Glycolysis, Aerobic, Anaerobic, Tricarboxylic acid cycle, Significance of TCA cycleintegrating metabolism of carbohydrates, proteins and lipids, Gluconeogenesis, Glycogenesis, Glycogenolysis, Hexose monophosphate shunt.
- Enzymes- Definition, Classification specificity of enzymes- Intracellular distribution, kinetics, inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis.

UNIT 2 **(1 Credit: 15 Contact Hrs.)**

- Proteins- Structure, Composition, Classification and Function, Structure of important proteins with special reference to insulin, myoglobin and haemoglobin, Binding proteins and their functions- nutritional implications, Chemistry and amino acid pool. Urea Cycle, Creatinine and Creatinine synthesis, Biochemical parameters and alterations in disease states and Protein malnutrition, Pregnancy, Inborn errors of metabolism.
- Nucleic Acids- Composition, Functions, Classification, Structure and properties of DNA and RNA, Replication and transcription of genetic information, Mechanism of

  DNA replication, transcription, translation, Genetic code- Protein biosynthesis, Regulation of biosynthesis recombinant DNA Technology. Breakdown of purine and pyrimidine, nucleotides.

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Lipids- Definition, Composition, Classification, Structure and Properties, Lipoprotiens,

  Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of

  Ketone Bodies, Biosynthesis of fatty acids, Phosphogycerides, Biosynthesis of

  Cholesterol and regulation , Bile acids and their metabolism, Plasma lipoproteins-

  Synthesis and Metabolism, Biochemical profile, alterations and significance, Prostaglandins.

- Biological Oxidation, Electron Transport Chain, Oxidative Phosphorylation.

References:

1. U.Satyanarayna, U.Chakrapani (2019) Biochemistry(5th edition)Elsevier India
2. A.C.Deb (2001) Fundamentals of Biochemistry,7th edition New Central Book agency
3. David l. Nelson Michael.M.Cox (2021) Lehninger Principles of Biochemistry(8th edition)W.H.Freeman and company
4. Jeremy M. Berg LubertStryer , John L. Tymoczko(2015) ,Biochemistry (8th edition)
5. .P .Agarwal(2014) Text book of Biochemistry, KrishanPrakashan
6. Ramkrishnan.S(1995),Nutritional Biochemistry,TR Publications
7. Dr.A.V.S.SramaRao (2010) Textbook of Biochemistry(11th edition) cbs Publishers Distributors Ltd
8. Patricia Trueman (2019) Nutritional Biochemistry(1st edition) MJP publishers 9. D.C.Sharma(2020)Nutritional Biochemistry (1st edition) CBS publishers

CC- 103 HUMAN NUTRITION AND MEAL MANAGEMENT (3 Credits: 45 Contact Hrs.)

Course Outcome:

1. Students will understand the functions and sources of nutrients, role of nutrients in maintenance of good health. Able to identify what foods are good sources for what nutrients.
2. Students will be familiar with factors affecting for the absorption of nutrients.
3. Students will gain knowledge about food pyramid, vegetarian diet, menu planning and nutritional needs during infancy to adolescents.
4. Students will come to know about the nutritional requirement of adults, nutritional needs during pregnancy and lactation, physiological changes and hormones involved during pregnancy and lactation, effects of ageing and life expectancy

UNIT 1 **(1 Credit: 15 Contact Hrs.)**

- Concept and Definition of terms- Nutrition, Malnutrition, Health, Brief history of Nutritional Science, Scope of Nutrition
- Minimum Nutritional Requirements and RDA, Formulation of RDA and Dietary Guidelines- Reference Man and Reference Woman.
- Body Composition and Changes through life cycle.
- Nutritional Requirements for different age groups with rationale, Factors affecting these requirements.
- Energy in Human Nutrition- Energy Balance, Assessment of Energy Requirements.
- Proteins- Protein Quality (BV, PER, NPU), Digestion and Absorption, Factors affecting protein bio-availability including Anti nutritional factors, Requirements

UNIT 2 **(1 Credit: 15 Contact Hrs.)**

- Lipids- Digestion and Absorption, Intestinal resynthesis of triglycerides- types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, w-3)
- Carbohydrates- Digestion and absorption, Blood Glucose and Effects of different carbohydrates on blood glucose, Glycemic index.

- Dietary Fibres- Classification, Composition, Properties and Nutritional Status significance.
- Minerals and Vitamins- Physiological Role, Bioavailability and Requirements

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Effects of cooking and home processing on digestibility and nutritive value of foods
- Improving nutritional value through different methods- germination, fermentation, combination of foods.
- Basic principles of meal planning.
- Nutritional considerations for planning meals for- Adults (male, female) with different level of activity; Pregnancy and Lactation; Feeding of young children 0-3 years; Old Age; Athletes
- Nutritional considerations in brief for the following: Military, naval personnel, Astronauts and food for space travel, Emergencies such as drought, famine, floods etc.

References-

1. Judith E. Brown, (2010), Nutrition through the life cycle (5th edition), Cenage Learning, USA
2. B. Shrilakshmi, (2016), Dietetics (8th edition), New Age International Publication, New Delhi.
3. Shubhangini Joshi (2000), Nutrition and Dietetics (4th edition), McGraw Hill Publication, New Delhi
4. B. Shrilakshmi, (2016), Human Nutrition for B.Sc. Nursing Students (4th edition), New Age International Publication, New Delhi.
5. M. Raheena Begum, (2005),Textbook of Food, Nutrition and Dietetics (3rd edition), Sterling Publishers, New Delhi
6. Joan Webster-Gandy, Angela Madden, Michelle Holdsworth; (2003), Nutrition and Dietetics (2nd edition), Oxford Publication, UK
7. Nix, Staci (2017), William's Basic Nutrition and Diet Therapy (15th edition), Elsevier, USA
8. AnjanaAgarwal, ShibhaUdupi, (2009), Text book of Human Nutrition (3rd edition), Jaypee Brothers Medical Publishers, New Delhi

CC- 104 MEDICAL NUTRITION THERAPY-1 (4 Credits: 60 Contact Hrs.)

Course Outcome-

1. Understanding the role of dietitian in disease prevention and management.
2. Learning Nutrition Care Process in a hospital/ clinical set up.
3. Students will be acquainted with the knowledge of nutrient/ food modifications in a therapeutic meal plan.

UNIT 1 (1 Credit: 15 Contact Hrs.)

- Diet Therapy and Nutritional Care in Disease- The Nutritional Care Process, Nutritional

  Care Plan, Assessment and Therapy in Patient Care, Implementation of Nutritional Care

- 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 persons

- Interaction 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; Nutritional status, Summary of action of some common drugs, Effect of food, nutrients and nutritional status on absorption and metabolism of drugs

UNIT 2 (1 Credit: 15 Contact Hrs.)

- Diseases of GI System- Nutritional Assessment- Pathogenesis of Upper GI Tract diseases- Diseases of esophagus and dietary care, diseases of stomach and dietary care, Gastric and duodenal ulcers, Predisposing factors and treatment, medical nutrition therapy, gastrectomy, Intestinal Diseases- Flatulence, Constipation, Irritable

Bowel Syndrome, Haemorrhoids, Diarrhoea, Steatorrhoea, Diverticular disease, Inflammatory

Bowel Disease, Ulcerative Colitis, Medical Nutrition Therapy; Malabsorption

Syndrome, Celiac Disease, Tropical Sprue, Intestinal Brush Border Defficiencies, Protein Losing Enteropathy, Dietary Care Process

- Diet in Diseases of Liver, Pancrease and Biliary System- Dietary Care and Management in Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's Disease, Dietary care and management in diseases of Gall Bladder and Pancreas-Biliary

  Diskinesia, Cholelithiasis, Cholecystitis, Pacnreatitis, Zollinger-Ellison Syndrome

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Diet in Infections- Nutrition and Infection, Metabolic changes during infection,

  Typhoid Fever- Definition, Causes/aetiology, pathophysiology, sign and symptoms, Treatment, Medical Nutrition Therapy; Tuberculosis- Definition, Causes/aetiology, pathophysiology, sign and symptoms, Treatment, Medical Nutrition Therapy; Malaria- Definition, Causes/aetiology, pathophysiology, sign and symptoms, spread, Treatment, Medical Nutrition Therapy; Dengue Fever- Definition, Causes/aetiology, pathophysiology, sign and symptoms, Spread, Treatment, Medical Nutrition Therapy; Swine Flu- Definition, Causes/aetiology, pathophysiology, sign and symptoms, Spread,

  Treatment, Medical Nutrition Therapy; COVID-19 infection (SARS COVI 2)-

  Definition, Causes/aetiology, pathophysiology, sign and symptoms, Spread, Treatment, Medical Nutrition Therapy; HIV Infection and AIDS- Definition, Causes/aetiology, pathophysiology, sign and symptoms, Spread, Treatment, Medical Nutrition Therapy

UNIT 4 **(1 Credit: 15 Contact Hrs.)**

- Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycemia- Classification, Physiological Symptoms and disturbances, Diagnosis (FBS and OGTT), Management of Diabetes Mellitus, Clinical Vs Chemical Control, Home Glucose Monitoring, Glycosylated Haemoglobin, Urine Testing, Exercise, Dietary Care and nutritional Therapy- The diet plan, Meal Planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes; Diabetes in Pregnancy, Elderly, Surgery, Diabetic diets in Emergency, Illness, Diabetic coma, Insulin reaction, Juvenile diabetes, Patient Education in Diabetes
- Diseases of Nervous System, Behavioural Disorders and Musculo Skeletal System-

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

Reference: -

1. Krause and Mahan, (2015), Food and Nutrition Care Process, 14th edition; Elsevier, New York.
2. Shrilaxmi B, (2019), Dietetics, New Age International Publishers, New Delhi, India
3. Joshi S., (2015), Nutrition and Dietetics, Mc Graw Hill Education, India
4. Agarwal S., Udupi S., (2014), Human Nutrition, Jaypee Publication, New Delhi, India
5. Gandy G., (2010), Oxford Handbook of Nutrition and Dietetics; Oxford Publication, UK
6. Width M, Reinhard T, (2012), The Essential Pocket Guide for Clinical Nutrition, Oxford, UK
7. Shrilakshmi B, (2019), Nutrition Science, New Age International Publishers, New Delhi, India.

LAB COURSE I

Standardization of portion sizes for different food preparations

- To plan for Routine Hospital Diets- Clear Liquid, Full Liquid, Soft Diet
- Planning of high energy recipe
- Planning of high protein recipe
- Planning of Vitamin A rich recipe
- Planning of Vitamin C rich recipe
- Planning of Vitamin B1 recipe
- Planning of Vitamin B2 recipe
- Planning of Vitamin B3 recipe
- Planning of Calcium rich recipe

Diet in Diseases of Gastro Intestinal Tract:

- To plan a diet for Peptic Ulcer.
- To plan a diet for Lactose Intolerance.
- To plan a diet for Coeliac Disease.
- To plan a diet for Constipation.
- To plan a diet for Diarrhea.
- To plan a diet for Uncreative Colitis

Diet In diseases of Hepatobiliary System

- To plan a diet for Hepatitis.
- To plan a diet for Cirrhosis of Liver.
- To plan a diet for Hepatic coma.
- To plan a diet for Cholelithiasis and Cholecystitis.
- To plan a diet for Pancreatitis.

Seminar

CC-201 MEDICAL NUTRITION THERAPY-2 (4 Credits: 60 Contact Hrs.)

Course Outcome-

1. Students will learn about various diseases and its management with nutrition intervention.
2. Understanding of pathophysiology, sign and symptoms and role of nutrition in prevention and treatment of diseases.
3. Application of knowledge of human nutrition in planning for therapeutic conditions.

UNIT 1 (1 Credit: 15 Contact Hrs.)

- 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, History, General Principles of Protein Nutrition in Renal Failure and Uremia, 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, Chronic renal failure in patients with diabetes mellitus, Chronic renal failure in children, Nephrolithiases – Etiology, types of stones, Nutritional care, alkaline-ash diets

UNIT 2 (1 Credit: 15 Contact Hrs.)

- Diseases of the Circulatory System- Atherosclerosis – Etiology, risk factors, diet; Hyperlipidemias, Brief review of Lipoproteins and their metabolism, 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.

- Anemia- Resulting from Acute Hemorrhage, Nutritional Anemia, Sickle Cell Anemia, Thallassemia, Pathogenesis and dietary management in the above conditions

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- 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
- Nutrition in Physiological Stress- Physiological stress and its effect on body, nutritional implications, Fevers and infections, Surgery and Management of Surgical Conditions, Dietary guidelines, Burns- Metabolic implications – nutritional requirement, Management and nutritional care
- Allergy- Definition, Symptom, Mechanism of Food Allergy, Diagnosis, Elimination Diets, Medication, Prevention

UNIT 4 **(1 Credit: 15 Contact Hrs.)**

- Diseases of the Adrenal Cortex, Thyroid Gland and Parathyroid Gland- Functions of Glands and hormones, Adrenal Cortex Insufficiency- Hyper and Hypothyroidism (goitre), Nutitional Care for weight Management, Regulation of energy intake, Control of appetite and food intake- Neural control, hormonal control, insulin, estrogen and other peptide hormones, Types of obesity, health risks, causes, psychology of obesity, theories of obesity, thermogenesis and thyroid hormones, treatment of obesity, medical nutrition therapy in obesity,

Behavioural Modifications- psychotherapy, pharmacotherapy, exercise and physical activity, surgery, prevention of weight gain and obesity

- Underweight – Etiology and Assessment, High calorie diets for
- weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia

Reference: -

1. Krause and Mahan, (2015), Food and Nutrition Care Process, 14th edition; Elsevier, New York.
2. Shrilaxmi B, (2019), Dietetics, New Age International Publishers, New Delhi, India
3. Joshi S., (2015), Nutrition and Dietetics, Mc Graw Hill Education, India
4. Agarwal S., Udupi S., (2014), Human Nutrition, Jaypee Publication, New Delhi, India
5. Gandy G., (2010), Oxford Handbook of Nutrition and Dietetics; Oxford Publication, UK
6. Width M, Reinhard T, (2012), The Essential Pocket Guide for Clinical Nutrition, Oxford, UK
7. Shrilakshmi B, (2019), Nutrition Science, New Age International Publishers, New Delhi, India.

CC-202 COMMUNITY NUTRITION **(3 Credits: 45 Contact Hrs.)**

Course Outcome-

1. Students will acquire knowledge about relation between community nutrition and health.
2. Students will be able to apply the concepts of nutrition in a community set up.
3. Students will gain knowledge about different factors in disease prevention and management at community level.

UNIT 1 **(1 Credit: 15 Contact Hrs.)**

- Concept and Scope of Community Nutrition.
- 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.
- 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. Food security and adequacy of diets.
- Use of other sources of information for assessment- Sources of relevant statistics, Infant, child and maternal mortality rates, Epidemiology of nutritionally related diseases.

UNIT 2 **(1 Credit: 15 Contact Hrs.)**

- Nutritional problems of communities and implications for public health. Common Nutritional Problems in India. Incidence – National, Regional. Causes: Nutritional and Non-Nutritional signs, symptoms, effect of deficiency and treatment, PEM, Micronutrient Deficiencies, Fluorosis, Correction/Improvements in Diets.

- Schemes and Programs in India to combat Nutritional Problems in India. Role of International, National and Voluntary agencies and Government departments.

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Hazards to Community Health and Nutritional status- Adulteration in food, Pollution of water, air, Waste management, Industrial effluents, sewage, Pesticide residue in food, Toxins present in food – mycotoxins etc.
- Nutrition Policy of India and Plan of Action
- Health and Nutrition Education – Steps in planning, implementation, and evaluations.

  Use of educational aids – visual, audio, audio-visual, traditional media e**tc.**

References

1. Vir S., (2012), Public Health Nutrition in Developing Countries Part 1 and 2; Woodhead Publishing India Pvt. Ltd, New Delhi, India
2. K Park, (2015), Preventive and Social Medicine, 26th Edition; Bhanot Publication, India
3. Eldelstein S, (2012), Nutrition in Public Health; Jones and Bartlett Publishers, United States
4. Swaminthan (1995), Food and Nutrition Volume I and II, The Bangalore Press, India.
5. Buttriss J, Welch A., Kearney J., (2017), Public Health Nutrition, John Willey Publisher, London
6. Sabarwal B, (2018), Public Health and Nutritional Care, Arjun Publishing House, India
7. Schneider M., (2013), Introduction to Public Health, Jones and Bartlett Publisher, United States

DSE 203: Food microbiology, Sanitation and Hygiene (3 Credits: 45 Contact Hrs.)

Course Outcome:

1. Students will understand the important pathogens and spoilage microorganisms in foods, the most likely sources of these organisms, and the conditions under which they grow, the role of beneficial microorganisms in foods and their use in fermentation processes.
2. Students will be able to use appropriate laboratory techniques to enumerate, isolate, and identify microorganisms in foods

UNIT 1 (1 Credit: 15 Contact Hrs.)

- Introduction to Microbiology – Mold, Yeast, Bacteria, Viruses, Protozoa, General Classification Family, Genus, Species. Study of their morphology, cultural characteristics and biochemical activities. Important microorganisms in foods, general
- 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
- Primary sources of micro-organisms in foods – Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization
- 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.

UNIT 2 (1 Credit: 15 Contact Hrs.)

- Microbes used in biotechnology – Useful micro-organisms, Fermented foods – raw material used, organisms and the product obtained, Benefits of fermentation.
- 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.

- 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.
- 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.

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Rodents and Insects as carriers of food-borne diseases. Control techniques
- 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 wat er in the washing process.
- Waste disposal, collection, storage and proper disposal from the premises.
- Legal administration and quality control, laws relating to food hygiene.

References-

1. Burton E. Pierce and Michael J. Leboffe, Microbiology, Laboratory theory and Application (3rd Edition), Morton Publishing company
2. Powar CB and Daginawala HF (2005), General Microbiology Vol. I and II 8th Edition, Himalaya Publishing House, Mumbai.
3. James M. Jay, Martin J. Loessner, David A. Golden • 2005, Modern Food Microbiology 6th Edition, Springer, US.
4. Bibek Ray, ArunBhunia • 2013, Fundamental Food Microbiology, 5th Edition, Taylor and Francis.
5. NeelimaGarg, K. L. Garg, K. G. Mukerji • 2010, Laboratory Manual of Food Microbiology, I. K. International Publishing house Pvt. Ltd.
6. Frazier, W. C, Food Microbiology, fifth edition 2014, McGraw Hill Education Pvt. Ltd.
7. Industrial Microbiology Casida, L. E.
8. M. R. Adams, M. O. Moss, Food Microbiology, 1995, New Age International (P) Limited, Publishers.

9. George J. Banwart, Basic Food Microbiology, First edition 1998, CBS Publishers and Distributors.

10. K. R. Aneja, Modern Food Microbiology, 2018, Vinod Kumar Jain, Scientific International Pvt. Ltd.

11. S. P. Narang, Food Microbiology; Methods of enumeration, 2016, A. P. H. Publishing House.

12. Dr. H. A. Modi, Food Microorganisms, 2008, Aavishkar Publishers and Distributors.

GE 204 Food Service Management **(3 Credits 45 Contact Hrs.)**

Course Outcome

1. Students will learn about food management and types of services in a hospital kitchen, industry kitchen, hotel kitchen etc.
2. Students will be able to understand the concepts behind running a food venture.

UNIT 1 **(1 Credit: 15 Contact Hrs.)**

- Introduction to food services and catering industry, Development of Food Service Institutions in India, Types of Services as affected by changes in the environment.
- 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.
- Organizations – Types of organizations and characteristics. Organizational charts.

UNIT 2 **(1 Credit: 15 Contact Hrs.)**

- Catering Management – Definition, Principles and Functions, Tools of Management Resources. Attributes of a successful manager.
- Approaches to Management Traditional, Systems Approach, Total Quality Management
- Management of Resources – Capital, Space, Equipment and Furniture, Materials,

  Staff, Time and Energy, Procedures Physical facility design and planning. Equipment selection.
- Purchase and store room management – Purchase systems, specifications, food requisition and inventory systems, quality assurance

UNIT 3 **(1 Credit: 15 Contact Hrs.)**

- Human Resource Management- Definition, Development and policies, Recruitment

  Selection, Induction, Employment procedures: Employee Benefits, Training and Development,

- Human Relations, Job description, Job specifications, Job evaluation, Personnel appraisal, Trade Union Negotiations and Settlement
- Financial Management (in brief since there is a separate subject Food Cost and Quality Control) – Elements of Financial management, Budget Systems and accounting, Budget preparation.
- Food Production and Service Operations- General Planning, Preliminary planning, Consideration of patients with specific nutritional and dietary needs, labour use and productivity, Flow pattern.

Reference:

1. Sethi Mohini. 2nd Edition. (2016) Institutional Food Management, New Age International Publishers.
2. Sethi M. and Malhan S.– 3rd Edition (2015) – Catering Management An Integrated Approach. New Age International Publishers.
3. Arora R. K. (2007). Food Service and Catering Management. A.P.H. Publishing Corporation, New Delhi.
4. Kinton R. and Ceserani V. (1992). The Theory of Catering. ELBS with Hodder and Stoughton.
5. Scanlon N.L. (2007). Catering Management. John Wiley and Sons, Inc.

LABORATORY COURSE II

Diet In Fever:

- To plan a diet for Typhoid fever.
- To plan a diet for Tuberculosis.
- To plan a diet for HIV Infection and AIDS

Diseases of Metabolic Disorder and Counseling:

- To plan a diet for Type I Diabetes Mellitus
- To plan a diet for Type II Diabetes Mellitus
- To plan a diet for Gout.

Diet in Kidney Diseases:

- To plan a diet for Nephrotic Syndrome.
- To plan a diet for Acute Renal Failure.
- To plan a diet for End Stage Renal Diseases
- To plan a diet for Urolithiasis.

Diet in Cardiovascular Diseases:

- To plan a diet for Dyslipidemia.
- To plan a diet for Hypertension.
- To plan a diet for Myocardial infarction.

Diet in Iron Deficiency Anaemia

Diet in Hyperthyroidism

Diet in Hypothyroidism

Diet in Overweight and Obesity

Diet in Underweight

Diet in Burn Patient

Diet in Rheumatoid Arthritis

Diet in Osteoarthritis

Diet in Cancer

Visit to Food Service establishment

Seminar

EQUIVALANCE FOR PGDND PROGRAM

Sr. No.	Old Course	Sr. No.	New Course
1	Field Work	1	Human Nutrition and Meal Management
2	Nutritional Biochemistry	2	Biochemistry
3	Dietetics and Diet Counseling	3	Medical Nutrition Therapy 1 and 2
4	Human Physiology	4	Human Physiology
5	Public Nutrition	5	Community Nutrition
6	Institutional Food Management	6	Food Service Management
7	Lab Course I	7	A)Seminar B) Lab Course I
8	Lab Course II	8	A) Dissertation B) Lab Course II
9	Dissertation and Seminar	9	Food Microbiology, Hygiene and Safety