KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641029

DEPARTMENT OF CLINICAL NUTRITION

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2024 – 2025)

VISION

To enhance nutrition knowledge and develop skills by integrating the principles of nutrition with diet therapy to promote a healthy society.

MISSION

To produce competent post graduates in the field of dietetics and clinical nutrition and to guide people on sound dietary practices based on our traditional food practices.

GOALS

1. Promote health care by advocating proper practice of nutrition and appropriate medical nutrition therapy.
2. Imbibe knowledge and develop new skills to be competent for the changing world.
3. Continuously get excited to learn through newer technologies
4. Pursue evidence based research and develop critical thinking skills in nutrition and health care
5. Promote the spirit of compassion and acquire higher values of education to blend with Indian culture.
6. Develop the spirit of social commitment and patriotism.

PROGRAMME OUTCOMES

1. Acquire knowledge in clinical nutrition for application in clinical settings.
2. Understand the medical condition and prescribe the appropriate dietary modifications.
3. Gain necessary skills for providing appropriate patient care considering their socio economic and cultural aspects.
4. Constantly keep abreast of current scientific development to enhance the competency.
5. Develop proper interpersonal skills for effective communication with the patients, community and team members.
6. Have proper camaraderie with the members of the health care team for effective patient care.
7. Exhibit commitment and responsibility as a member of health care team.
8. Develop good ethics and values in the chosen profession thereby contributing to nation building.

PROGRAMME SPECIFIC OUTCOMES

1. The knowledge acquired in nutrition is to be applied in therapeutic nutrition care.
2. Provide solutions through therapeutic diets with an understanding of the disease conditions
3. Learn skills of menu planning for quality and quantity preparation and management of resources.
4. Produce competent professionals with sound knowledge of nutrition and capacity to keep abreast of current developments.
5. Recommend food choices based on nutrient requirements for menu planning for different stages of life and special conditions taking into consideration their socio-economic level and cultural practices.

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Programme Name : M.Sc. Clinical Nutrition

Curriculum and scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2024-2025)

Semester	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
				CIA	ESE	TOTAL		
I	24PCN101	Core Paper 1- Community and Public Health Nutrition	5	25	75	100	3	4
	24PCN102	Core Paper 2-Human Physiology	6	25	75	100	3	4
	24PCN103	Core Paper 3-Advanced Nutrition	5	25	75	100	3	4
	24PCN104	Core Paper 4-Life Span Nutrition	4	25	75	100	3	4
	24PCN1CL	Core Practical -1 – Community Nutrition	5	100	-	100	3	4
	24PCN1E1	**Major Elective 1**	**5**	**25**	**75**	**100**	**3**	**5**
		Total	**30**	**-**	**-**	**600**	**-**	**25**
II	24PCN205	Core Paper 5- Nutrition in Clinical Care- I	5	25	75	100	3	4
	24PCN206	Core Paper 6- Clinical Biochemistry	5	25	75	100	3	4
	24PCN207	Core Paper 7- Biostatistics & Research Methods	4	25	75	100	3	4
	24PCN2CM	Core Practical 2- Clinical Biochemistry	3	40	60	100	3	5
		Core Practical 3- Nutrition in Clinical Care- I	4	-	-	-	-	-
	24PCN2E2	**Major Elective 2**	**5**	**25**	**75**	**100**	**3**	**5**
	24PGI2N1	**Non-Major Elective 1**	**4**	**100**	**-**	**100**	**3**	**4**
	24PCN3IT	**Summer Hospital-Internship ******	Grade	**-**	**-**	**-**	**-**	**-**
		Total	**30**	**-**	**-**	**600**	**-**	**26**
III	24PCN308	Core Paper- 8- Nutrition in Clinical Care- II	5	25	75	100	3	4
	24PCN309	Core Paper 9 Nutraceuticals & Drug Nutrient Interaction	5	25	75	100	3	4
	24PCN310	Core Paper 10- Sports & Fitness Nutrition	4	25	75	100	3	4
	24PCN311	Core Paper 11- Clinical Health Psychology	4	25	75	100	3	4
	24PCN3CN	Core Practical 3- Nutrition in Clinical Care- II	5	40	60	100	3	5
	24PCN3N2	**Non-Major Elective 2**	**5**	**25**	**75**	**100**	**3**	**4**
	24PCN3X1	**EDC Paper**	**2**	**100**	**-**	**100**	**3**	**2**

		Total	**30**	**-**	**-**	**700**	**-**	**27**
IV	**24PCN4Z1**	**Residential Training (Hospital)**	**-**	40	160	**200**	**-**	8
	24PCN4Z2	**Project and Viva voce**	**-**	20	80	**100**		4
		Total	**-**	**-**	**-**	**300**	**-**	**12**
		Grand Total	**-**	**-**	**-**	**2200**		**90**

Note:

CBCS – Choice Based Credit system

CIA – Continuous Internal Assessment

ESE – End of Semester Examinations

Major Elective Papers
(2 papers are to be chosen from the following 4 papers)

1. **Medical Microbiology**
2. **Food Microbiology**
3. **Food Service Management**
4. **Health Care Management**

Non-Major Elective Papers
(2 papers are to be chosen from the following 4 papers)

1. **Information Security #**
2. **Computer Application in Nutrition**
3. **Nutrition Counseling**
4. **Nutrition in Environmental Health**

to be offered by the respective departments.

Sub. Code & Title of the Extra Departmental Course (EDC) :

24PCN3X1 – EDC Paper 1 – Fundamentals of Nutrition

Note: In core subjects, no. of papers both theory and practical are included wherever applicable. However, the total credits and marks for core subjects remain the same as stated below.

Tally Table:

Subject	No. of Subjects	Total Marks	Credits
Core – Theory / Practical / Project	17	1700	70
Major Elective Papers	2	200	10
EDC Paper	1	100	2
Non Major Elective Paper	2	200	8
Grand Total	**22**	**2200**	**90**

- 25 % CIA is applicable to all subjects except JOC, ALC and COP which are considered as extra credit courses.
- The students to complete any **MOOC On learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** before the completion of the 3rd semester and the course completion certificate should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.
- **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the faculty or HOD.

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75 = 150/10)	25
CIA II	75	15	
Assignment/Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
Project			
Review		15	20
Regularity		5	
Residential Training (Hospital)			
Review		30	40
Regularity		10	

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remembering;**K2**-Understanding;**K3**-Applying;**K4**-Analyzing;**K5**-Evaluating

1. Theory Examination

CIA I & II and ESE: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

2. Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments	50	60
K4	Record Work	10	
K5			

3. Project Viva Voce:

Knowledge Level	Section	Marks	Total
K3	Project Report	60	80
K4	Viva voce	20	
K5			

4. Residential Training (Hospital)

Knowledge Level	Section	Marks	Total
K3	Report	140	160
K4	Viva voce	20	
K5			

Sub. Code: 24PCN101

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 1: **Community and Public Health Nutrition**				
Batch 2024 – 2025	Hours /Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To acquire methods used to assess the nutritional problems in community and the role of welfare programs and health agencies in improving health status.
2. To acquire knowledge in planning, preparation and implementation of nutrition education programs.
3. To develop skills on assessing data on health and nutritional status of individuals and the community.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To define the role of community nutritionist and able to describe health in terms of determinants and indicators of health.
	CO2	To explain the nutritional problems and supplementary feeding programs.
	CO3	To Assess nutritional status of community and discuss the dietary pattern.
	CO4	To Plan and execute nutrition education program.
	CO5	To Explain about the food distribution programs for emergency situations.

Syllabus

Unit I **(15 Hours)**

Community Health and Nutrition - Health - definition, concepts of community health – biomedical, ecological,psychological and holistic*, Determinants of health, Indicators of health

Epidemiology – Definition, methods of epidemiological studies – retrospective study, prospective study, case control study, cohort study, randomized control trials, non-randomized control trials.

Unit II **(15 Hours)**

Public Health aspects of Nutrition - Protein Energy Malnutrition, Synergism between infection and PEM, Iodine deficiency disorder, Iron deficiency anemia and Fluorosis.

Occupational health hazards – Physical, Chemical and Biological hazards - prevalence, prevention and control; Hazards in Industries hospital, textiles, foundry, agriculture and radiation: Controlling measures and legal provisions.

Unit III **(15 Hours)**

Assessment of Nutritional Status of the community – Anthropometry, clinical examination, Biochemical estimation, Biophysical methods; vital statistics and ecological factors; Functional assessment, Diet Survey

Nutrition Education - Aids for mass communication, small group communication; Identification, selection, execution and evaluation of nutrition education programme for the community.

Sub. Code: 24PCN101

Unit IV **(15 Hours)**

Health administration in India

Welfare Programmes – Maternal and child health (specific reference to immunization programme); Nutrition programmes; public nutrition approach to tackle nutritional problems; Policies and programmes of the government and NGO sector of vulnerable groups, Millennium Development Goals

Health status in India (based on current statistics)- Definition, principles and objectives of community health administration and policy; Prevalence of lifestyle diseases in India; Nutritional health policy, Health care deliverysystem at central, state and district level (specific reference to PHC).

Unit V **(15 Hours)**

Disaster Management: Emergency situations arising from famine, earthquake, flood and tsunami; nutritional problems in emergencies, nutritional relief and rehabilitation – organizations involved in food distribution strategies.

Health Agencies –UNICEF, FAO, UNDP, ILO, UN, UNESCO, WHO, USAID, CARE, ICDS,ICMR, NFHS* World Bank - Functions and beneficiaries. Food and Nutrition Security: Food production, Food Security, Socio-cultural aspects and Dietary Patterns: Their implications for Nutrition and Health.

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Classroom/ Models/Demonstration/*Self-Study

References

1. Park K.,2013, Text book of Preventive and social medicine, Bamarasidas Bahnot Publishers, Jabalpur.
2. Jellilfe D. B., Infant nutrition in tropics and subtropics, WHO, 1965.
3. Bamji M. S., Prahalad Raov, Reddy V, Text book on human nutrition, Oxford and IBM publishing co. Pvt. Ltd.
4. Proceeding of Nutrition Society of India, NIN.
5. Technical reports of ICMR.
6. P.K. Shukla, Nutritional problems of India, Prentice Hall, India.
7. Sabarwal B., Applied Nutrition and Health education, common wealth publishers, New Delhi.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	H	S
CO2	S	S	L	S	S
CO3	S	S	H	M	S
CO4	M	S	S	S	M
CO5	M	M	L	S	H

S- Strong H-High M- Medium L- Low

Sub.Code:24PCN102

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 2: **Human Physiology**				
Batch 2024 – 2025	Hours / Week 6	Total Hours 90	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To acquire Knowledge on major functions of body systems.
2. To understand the complexity of the human body and it's linking disorder.
3. To appreciate the interrelationship between various organ systems and their functioning in unison to maintain health.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Understand the physiological functions of various systems
	CO2	To Integrate the mechanism of various organ systems in regulating homeostasis
	CO3	To Relate the different functions of the various organ system in the body.
	CO4	To Understanding the functioning of the immune system of the body.
	CO5	To Relate the physiological function to nutrition and diet.

Syllabus

Unit I **(18 Hours)**

Cell - Function of a cell- synthesis, energy production and transport across cell membrane, Membrane Potential and Action potential; Tissue – types.

Immune system – Innate, Cell mediated and Humoral immunity, antibody production, Immune deficiency diseases, auto immune diseases, allergy.

Blood- Composition*, Homeostasis, formation of blood component, blood clotting, blood grouping.

Unit II **(18 Hours)**

Circulatory system - Blood flow - blood flow through cardio vascular system*, Origin and transmission of impulse through heart muscle, cardiac cycle and output & heart rate, blood pressure, hypertension, hemorrhage, shock, heart failure.

Respiratory system - Mechanism of respiration – role of lungs in exchange of gases. Cardio- respiratory response to exercise, respiratory abnormalities – hypoxia, apnea, hypo and hyperventilation.

Unit III **(18 Hours)**

Digestive system - Mechanism of secretion of digestive juices, movements of GI tract, digestion and absorption, gastrointestinal hormones. Regulation of food intake-hunger, satiety.

Role of liver, Pancreas and gall bladder and their dysfunctions.

Sub.Code:24PCN102

Excretory system - formation of urine, Renin angiotensin mechanism; renal handling of individual substances – inulin, urea and para- amino hippuric acid, Dialysis.

Unit IV **(18 Hours)**

Endocrine glands – Hormones-Role of hormones, regulation of hormonal secretions, underactivity and over activity of endocrine glands, sex hormones, emphasis on stress hormones.

Reproductive system -Spermatogenesis and oogenesis, ovulation cycle and menstrual cycle, menopause, infertility – hormonal related.

Unit V **(18 Hours)**

Nervous system - Functions of brain and spinal cord, Cranial and spinal nerves, conduction of nerve impulses, role of neurotransmitters; afferent & efferent nerves, blood brain barrier, degeneration and regeneration of nerve fibers. Hypothalamus and its role in obesity sleep and memory

Special senses - eye, ear, nose and taste buds –structure (self-study) and mechanism of vision, hearing, equilibrium, smell and taste; Rhodopsin cycle; clinical disorders of eye, ear, nose and taste buds

Teaching Method

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Classroom/ *Self - Study/ Models/Demonstration

References

1. Sembulingam K, Essentials of Medical physiology, Jaypee Medical Publishers, NewDelhi, 2010.
2. Principles of Anatomy and Physiology, 2016,15th
3. Edition,Gerard J. Tortora, Bryan H. Derrickson, Wileyplus Robin R Preston, Thad E Wilson, 2018, Lippincott's illustrated Reviews Physiology, Current book international.
4. Mackenna BR, Callander R 1997, 6th Edition, Illustrated physiology, Churchill Livingstone Publications, Singapore
5. Arthur J Vander, James H Sherman, Dorothy S Luciano, 8th edition, Human Physiology,McGraw Hill,2001 .
6. Anil Baran&SinghaMahapatra, , Essentials of medical physiology,McGraw Hill, New Jers, 2006.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	L	H	S
CO2	S	S	M	S	S
CO3	S	S	S	M	S
CO4	M	S	S	M	L
CO5	H	H	M	S	S

S- Strong H-High M- Medium L- Low

Sub.Code:24PCN103

Programme Code:25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 3: **Advanced Nutrition**				
Batch 2024 – 2025	Hours / Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To enable the students to understand the functions of various nutrients
2. To learn the effects of deficiency and excess of nutrients
3. To relate the functions of nutrients in recommending for clinical conditions

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Understand the functions, deficiency and excess of major and minor nutrients
	CO2	To Learn about the role of water and electrolytes in the body
	CO3	To Disseminate the knowledge about the importance of fiber
	CO4	To Understand the inter relationship between the various nutrients
	CO5	To Integrate the role of nutrients in clinical conditions

Syllabus

Unit I **(15 Hours)**

Energy- Energy Value of Foods, SDA, Factors affecting energy input and output, BMR and factors affecting BMR; Carbohydrates- Types,functions, digestion, absorption, utilization and storage; Fibre- Types, Role of fiber in gastro intestinal tract, effects of over consumption of fiber

Unit II **(15 Hours)**

Proteins- Types, Nutritional classification of amino acids, functions of proteins, digestion, absorption, utilization and storage, protein turn over, effects of deficiency Lipids- Types, functions, digestion, absorption, utilization and storage, effects of deficiency and excess of fats, lipotropic factors.

Unit III **(15 Hours)**

Vitamins- Fat Soluble Vitamins - A, D, E, K – Functions, utilization, storage, excretion, dietary source, effects of deficiency and excess Water Soluble Vitamins – Thiamine, Riboflavin, Niacin, Pantothenic acid, Pyridoxine, Biotin, Vitamin B12, Folic acid, Ascorbic acid - Functions, Utilization, storage, excretion, dietary source, effects of deficiency and excess*.

Sub.Code:24PCN103

Unit IV **(15 Hours)**

Minerals- Calcium, Phosphorous, Iron, Magnesium, Manganese, Copper, Zinc, Fluorine, Iodine, Selenium, Cobalt, Sodium, Potassium- Distribution in the body, Functions, utilization, storage, excretion, dietary source, effects of deficiency and excess*.

Unit V **(15 Hours)**

Water- Distribution in the body, role of water, water balance- factors affecting water Balance. Electrolytes-Electrolyte content in tissue compartments, functions of Sodium, Potassium and Chloride, factors affecting electrolyte balance

Teaching Methods

Chalk and Talk, Power point Presentations, Seminar, Quiz, Assignment, Smart Class Room,*self-study

References:

1. Michael. J. Gibney ; Clinical Nutrition, Blackwell Science, 2005.
2. Shubhangini. A. Joshi; Nutrition and Dietetics III edition, McGraw Hill Education (India) private limited
3. Srilakshmi.B; Nutrition Science, 15th edition, New Age International (P) Limited, Publishers, 2016.
4. Swaminathan. M; Advanced Text-Book on Food and Nutrition, Volume I 2nd edition. The Bangalore Printing and Publishing Co., LTD, Reprint 2015.
5. Sunetra Roday; Food Science and Nutrition, 2 nd edition, Oxford University Prerss, 2013
6. Carol Byrd – Bredbenner; Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition 2013

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	L	H	S
CO2	S	S	M	S	S
CO3	S	S	S	M	S
CO4	M	S	S	M	L
CO5	H	H	M	S	S

S- Strong H-High M- Medium L- Low

Sub. Code: 24PCN104

Programme Code:25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 4: **Life Span Nutrition**				
Batch 2024-2025	Hours/ Week 4	Total Hours 60	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the role of nutrition in the various stages of life span.
2. To plan and recommend diets based on the nutritional requirements of different age groups.
3. To formulate a dietary intervention plan to address nutritional deficiencies or excesses according to the health needs of individuals.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Acquire knowledge in the science of nutrition and health for different stages of life.
	CO2	To Emphasize the importance of nutrition during pregnancy, lactation and complementary foods for infants.
	CO3	To Disseminate facts on the importance of proper selection of foods for good nutrition during pre-school and school age for laying the foundation for ensuingyears.
	CO4	To Explain the physiological development, psychological changes and psychosocial problems of adolescents in relation to nutritional status.
	CO5	To Apply the knowledge of nutrition science for recommending nutritious diet for a healthy adult and develop proper nutrition intervention based on the physiological conditions.

Syllabus

Unit I **(12 Hours)**

Recommended Allowances for Indians and basis of computation of the allowances for macronutrients and micronutrients.

Nutrition in Pregnancy - Physiology of pregnancy; maternal physiological adjustments, maternal weight gain; subjective and objective symptoms of pregnancy; Stages of human fetal growth, mechanism and regulation of fetal growth, Nutrient requirements during Antenatal and postnatal periods, Interaction of life style and pregnancy – alcohol, illegal drug use, cigarette smoking and caffeine. Complications of pregnancy- hyperemesis, Pre-eclampsia, eclampsia and gestational diabetes. Nutrition requirements during pregnancy.

Unit II **(12 Hours)**

Nutrition in Nursing - Physiology of lactation, hormonal control and reflex action, efficiency of milk production; Breast feeding and its relationship to the development of immune system, oral motor development and gastro intestinal tract development; value of breast feeding and contra-indications to breast feeding; Nutrient requirements during lactation. Composition of breast milk, cow's milk & infant formulae. Lactogenic foods.

Nutrition in Infancy – Growth & maturation, Reference standards for growth and growth monitoring; Infant feeding - nutritional requirement of full-term infants; Bottle feeding; weaning practices; feeding problems of normal infants. Sequence of development of feeding behavior. Complementary feeding, Feeding skills and neuromuscular development.

Unit III **(12 Hours)**

Nutrition in preschool age - Physical growth and development related to neuromuscular development*, eating behavior, nutritional requirements of preschool children; factors influencing food choices, standard for growth monitoring

Sub. Code: 24PCN104

Nutrition in school children - Physical growth, height and skeletal maturation, weight and anthropometric measurement, Standards for growth monitoring*, nutritional requirements of school children, factors to be considered while planning a menu; feeding problems of underweight and hyper active children, dental health; packed lunch and its effect on nutritional status. Nutritional related health issues in childhood.

Unit IV **(12 Hours)**

Nutrition during adolescence – Growth and development – physical growth and psychosocial development*, body Composition changes; Factors influencing menarche, psychological problems and challenges in adolescence, body image, weight control, skipping meals, anorexia nervosa, under nutrition, obesity, iron deficiency anemia; snacking, fast foods; sense of identity- addiction to cigarettes, alcohol and
drugs. Nutritional requirements

Unit V **(12 Hours)**

Nutrition during Adulthood –Physiological changes of adulthood – male climacteric change, female – menopausal changes, Osteoporosis and Osteopenia; Factors influencing nutritional requirements of the adult; **Geriatric Nutrition -** body composition, physiological, metabolic, psychosocial and cognitive changes. Assessment of Nutritional and health status of elderly, Factors influencing nutritional requirements of elderly, Interventions for impaired appetite- oral health problems, swallowing problems and dry mouth. Chronic degenerative diseases and nutritional problems of the elderly - etiology, pathogenesis, management, prevention and control.

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/GoogleClassroom/*Self - Study

Reference:

1. Gordon. M. Wardlaw et.al; Contemporary Nutrition, 2nd edition, Publishing by Mosby, 2004.
2. Srilakshmi. B; Dietetics, 7th edition, New Age International (P) Limited Publishers, 2014.
3. William's; Nix; Basic Nutrition and Diet therapy, 14th edition, Publishing by Mosby, 2013.
4. Mahtab S. Bamji, Prasad Rao, N. Vinodini Reddy; Textbook of Human Nutrition, Second Edition Oxford and IBH Publishing Co. Pvt. Ltd, 2003.
5. Nutrient Requirement and Recommend Dietary Allowances for Indians by Indian council of Medical research, National Institute of nutrition, Hyderabad.
6. Judith E. Brown., Nutrition New, 2nd edition, West / Wads wroth west / Wadsworth, An International Thomson publishing company, 1998

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	M	H	S	S	H
CO2	M	H	S	H	S
CO3	L	H	M	S	S
CO4	M	H	M	H	H
CO5	H	H	M	H	S

S- Strong H-High M- Medium L- Low

Sub.Code : 24PCN1CL

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Practical 1: **Community Nutrition**				
Batch 2024-2025	Hours / Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Assess the nutritional status of different age groups
2. Enrich the knowledge on low cost locally available indigenous foods
3. Plan and implement nutrition intervention programs.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Conduct health assessments and develop nutrition interventions for individuals, groups and communities.
	CO2	To Use effective teaching strategies for individuals, groups, or through community education programming.
	CO3	To Demonstrate active participation, teamwork and contributions in group and professional settings.
	CO4	To Evaluate food and nutrient intake for familyand community.
	CO5	To Formulate menu for different age groups based on their socio-economic levels

Syllabus **5 hours/week**

- Anthropometric Measurement of community - Height, weight, circumference of Head and Chest, Mid-upper arm circumference of children; Comparison with norms and interpretation of the nutritional assessment data and its significance - Weight for age, height for age, weight for height.
- BodyMass Index (BMI), Waist - Hip Ratio (WHR) for Adults
- Clinical assessment and signs of nutrient deficiencies; Development of Low- cost nutritious recipes, sensory evaluation of selected recipes for nutrient deficiencies.
- Estimation of food and nutrient intake - Household food consumption – using coefficient of consumer unit, 24 hours dietary recall, weighment method, food diaries, food frequency questionnaire - for households.
- Nutrition cum Health Education for rural population through development of selected Nutrition Education tools.

Mapping

PSO / CO	**PSO1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	S	H	S	H
CO2	S	S	L	M	H
CO3	M	M	L	S	M
CO4	S	S	S	M	S
CO5	S	S	S	H	S

S- Strong H-High M- Medium L- Low

Sub. Code: 24PCN205

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper**:** Core Paper 5: **Nutrition in Clinical Care I**				
Batch 2024 – 2025	Hours / Week 5	Total Hours 75	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the nutrition principles and their application in disease prevention and treatment.
2. To interpret and translate the scientific knowledge and principles related to nutrition into practical meal planning in the preparation of therapeutic diets.
3. To prescribe appropriate diet plans for diverse disease conditions.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Utilize the basic nutrition knowledge acquired to understand the various stepsin nutrition care process.
	CO2	To Provide diet counseling to individuals, patients and groups.
	CO3	To Describe the various types of hospital diets and indications for use in clinical settings.
	CO4	To Apply principles of medical nutrition therapy for the dietary managements of lifestyle diseases namely CVD, Diabetes Mellitus and COPD
	CO5	To Explain nutrition care process to meet the nutritional needs for various diseases (Musculoskeletal, Endocrinal, hepatic pancreatic and immune system disorders)

Syllabus

Unit I **(15 Hours)**

Diet Therapy: Principles and objectives, role of dietitian in hospital and community, goals and policies of IDA*, diet prescription, diet counseling guidelines for dietary planning and use of exchange lists in nutrient calculation and menu planning -Routine hospital diets and modifications for different diseases or disorders

Nutritional Care Process: Nutritional assessment of hospitalized patient -Identification of problems, Nutrition diagnosis, Nutrition intervention, monitoring and evaluation of patient care.

Unit II **(15 Hours)**

Nutrition Therapy for Diabetes Mellitus and Endocrinology: Etiology, types, symptoms, metabolism, complications, diagnostic tests, Blood glucose control and treatment, influence of drug and exercise, artificial sweeteners, fat substitutes. Dietary management. Nutrition counselling in the management of Diabetes.

Thyroid disorders - Hypo and hyperthyroidism- tetany- hypocalcemia, Adrenal disorders Addison's disease, Cushing syndrome, Adrenal fatigue, Polycysticovariansyndrome

Sub. Code: 24PCN205

Unit III **(15 Hours)**

Nutrition Therapy for Cardiovascular Diseases: Congestive heart failure, coronary heart disease, atherosclerosis, hypertension, hyperlipidemia, Cardio metabolic Syndrome, Hyper uricemia, role of antioxidants, Dietary Management and Nutrition therapy. Nutrition counselling in the management of Cardiovascular Diseases

Nutrition Therapy for Anaemia: Anaemia - Monocytic, megaloblastic, microcytic, sickle cell, hemolytic (student directed learning), Nutritional and Non-nutritional anaemia.

Unit IV **(15 Hours)**

Nutrition Therapy for Hepatobiliary and Pancreatic disorder-: Liver –Acute liver failure; neonatal hepatitis, Acute viral hepatitis, alcoholic liver disease, cirrhosis, hepatic encephalopathy, pre and post liver transplantation. Wilson's disease and Hemochromatosis. Pancreatitis, Pancreatic cyst and cancer.

Unit V **(15 Hours)**

Dietary Management in Pulmonary Diseases and Musculoskeletal Diseases: Chronic obstructive pulmonary diseases, asthma, Arthritis (osteo and rheumatoid), epilepsy, dysphagia Dietary Management in Burns, Stress and Shock.

Dietary Management in Immune System Diseases: AIDS, Hypersensitivity (natural history and prevention)-Allergy, food allergens, antigen absorption, oral challenge procedures, immediate reactions to foods, celiac disease (gluten sensitive enteropathy), adverse reactions to MSG, asthma and food additives; nutraceuticals as immune-boosters and anti-inflammatory agents (Case based Learning)

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Classroom/Case Studies/*-Self - Study

References:

1. Krause, Food, Nutrition and Diet therapy, 12th edition, W.B. Saunders Company, 2012.
2. Michael. J. Gibney etal; Clinical Nutrition Blackwell Science, 2005.
3. Shubhangini. A. Joshi; Nutrition and Dietetics, 3rd edition, McGraw Hill Education
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5. Srilakshmi . B; Nutrition Science, 15th edition, New Age International (p) Limited, publishers, 2016.
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7. Edition, The Bangalore printing and publishing co., LTD, Reprint 2015.
8. Sunetra Roday; Food Science and Nutrition, 2nd edition, Oxford University press, 2013.
9. Carol Byrd – Bredbenner; Wardlaw's perspectives in Nutrition, 9th edition McGraw –

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO5
CO1	M	H	M	S	S
CO2	M	H	L	H	S
CO3	M	H	L	H	S
CO4	H	H	M	H	S
CO5	M	H	H	S	S

S- Strong H-High M- Medium L- Low

Sub. Code: 24PCN206

Programme Code:25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 6: **Clinical Biochemistry**				
Batch 2023 – 2025	Hours / Week 5	Total Hours 75	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To understand the metabolism of various nutrients
2. To learn the techniques of function tests and relate to clinical diagnosis
3. To integrate metabolism of nutrients with diet planning

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Understand metabolism of nutrients and function tests
	CO2	To Recall biochemical changes occurring in disorders.
	CO3	To Explain clinical significance of metabolic cycles.
	CO4	To Relate the function tests with metabolism.
	CO5	To Associate the biochemical function with nutrition.

Syllabus

Unit I **(15 Hours)**

Carbohydrates - Composition and classification* - General metabolism – Glycolysis, TCA cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis and Glycogen storage diseases – clinical importance, Hormonal regulation of blood glucose.

Unit II **(15 Hours)**

Lipids – Composition and classification (self-study), Metabolism of Lipids, Biosynthesis of fatty acids, Biosynthesis of Cholesterol, Plasma lipoproteins - Composition, Classification, Functions, Synthesis,

Unit III **(15 Hours)**

Protein- Composition and classification*, Urea - formation and its clinical significance, Creatine and Creatinine – synthesis, regulation, creatineuria. Electron Transport Chain, Oxidative phosphorylation and Biological Oxidation. Interrelation of carbohydrate, protein and fat metabolism – Role of vitamins and minerals in metabolism. Metabolism in starvation

Sub. Code: 24PCN206

Unit IV **(15 Hours)**

Enzymes -Definition, Classification of enzymes - Enzymes in clinical diagnosis

Nucleic Acids - Structure of DNA and RNA *, Types of RNA mRNA, tRNA, rRNA, Sn RNA, Si RNA, Hn RNA. Structure of t-RNA. Nucleotides as source of energy, component of coenzymes, second messengers.

Unit V **(15 Hours)**

Function tests

Liver Function tests - liver function tests, diagnostic tests, (two tests each)

Gastric Function Test - Test for malabsorption – Fat – Qualitative and quantitative analysis; Protein – Serum protein, albumin.

Oncogenic markers – classification and clinical uses

Radioisotopes – diagnostic and therapeutic uses Cerebrospinal fluid – Clinical significance.

Renal function Test -Manifestation of clinical symptoms, classification – glomerular filtration tests, renal plasma flow test, tubular function tests.

Thyroid Function Test - Thyroid function – T3 and T4 and TSH,

Cardiac Function test - Tests used to estimate increased risk of cardio vascular disease, C-reactive protein.

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/GoogleClassroom/*Self - Study

References

1. Deb. A.C., Fundamental of Biochemistry, New Centruy Book Agency (P) Ltd, Reprint 2004.
2. 2. Ambika Shanmugam, Fundamentals of biochemistry for Medical students, Karthik
3. Pprinters, 7thedition, 1992.
4. 3. U.Sathyanarayana and U.Chakrabani, Biochemistry, Third Edition, Uppala- Author
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6. 4. Mahtab. S.Bamji, Kamala Krishnaswamy and G.N.V Brahmam, Text Book of Human
7. Nutrition, Oxford and IBH Publishing Company, Third Edition.2009.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	M	M	M	H	H
CO2	L	M	M	S	H
CO3	M	H	H	H	H
CO4	H	H	S	H	S
CO5	M	H	H	S	S

S- Strong **H-High** **M- Medium** **L- Low**

Sub. Code: 24PCN207

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 7: **Biostatistics & Research Methods**				
Batch 2024 – 2025	Hours / Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To understand the concepts of research process.
2. To discuss the concepts and procedures of statistical analysis.
3. To develop the skills involved in testing and its significance.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be

K1 To K5	CO1	To Remembering about the fundamental ideas of research methodology.
	CO2	To Understanding the concepts of sampling design and the collection of data.
	CO3	To Applying the collection of data in Vital Statistics, Health Statistics and Hospital Statistics.
	CO4	To Analyzing the measures of central tendency.
	CO5	To Evaluating the testing of hypothesis using z test, ANOVA and Chi square test.

Syllabus

Unit I **(12 Hours)**

Meaning of Research – Objectives – Motivation – Significance – Criteria for good research and research process – Proforma construction – Observation Studies – Cross – sectional studies – Cohort study – Case control study design – Randomized Controlled trials.Clinical trials related to nutrition- Ethical concern.

Unit II **(12 Hours)**

Research design – Meaning need features of good design concepts – Types – Basic principles – Developing a research plan – planning and Execution of survey-Data collection methods – Measurement Scale – Sampling methods – Sample size determination –Tabulation* – Presentation and diagrams – Report writing, article and abstract publication, Principles and Methods of Patenting.

Unit III **(12 Hours)**

Vital Statistics: Introduction – Uses of Vital Statistics – Mechanism for collection of Vital Statistics – Basic Formulae for calculation of vital statistics – Mortality rates – Fertility rates. Health Statistics: Introduction – Utilization of basic data – Sources of Health Statistics – Problems in the collection of sickness data – Measurement of Sickness – Hospital Statistics – International Classification of Diseases.

Sub. Code: 24PCN207

Unit IV **(12 Hours)**

Measures of central tendency – Measures of dispersion. Simple correlation and simple regression – simple problems – multiple correlations and multiple regression analysis (concept only) – *Probability theory and distributions (basic theoretical concepts only).

Unit V **(12 Hours)**

Hypothesis testing: z test for means, proportions, SD's and finding confidence intervals – t test for single mean and two mean – Independent and dependent samples – ANOVA – One-way classification only – Chi square test for independent of attributes and homogenous. Introduction to SPSS and R-programming (practical Approach)

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Classroom/*Self - Study

References

1. Kothari, C.R; Research Methodology, 2nd edition, New Age International Publishers,2004.
2. Gupta, S.P; Statistical Methods, 31st revised edition, Sultana Chand and Sons, 2002.
3. Devadas, R.P; A Handbook on Methodology of Research, Sri Ramakrishna Vidhyalaya, Coimbatore, 1989.
4. Donald, H.M.C. Burney; Research Methods, fifth edition, Thomson and Wadsworth Publications, 2002.
5. Pillai,R.S.N and Bagavathi,V , Statistics, Chand and company limited, 2001

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Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	H	S	H	S	M
CO2	M	S	M	S	M
CO3	S	S	H	S	H
CO4	S	H	S	S	H
CO5	S	H	M	S	H

S- Strong H-High M- Medium L- Low

Sub Code:24PCN2CM

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Practical 2: **Clinical Biochemistry**				
Batch 2024 – 2025	Hours / Week 3	Total Hours 45	Credits 5	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire skills in carrying out clinical biochemical tests.
2. To learn to interpret the results obtained.
3. To understand the importance of biochemical tests in the diagnosis of diseases.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Learn the qualitative analysis of normal and pathological urine
	CO2	To Understand the applications of principles of the experiments
	CO3	To Acquire hands-on experience on the quantitative analysis.
	CO4	To Gain skills in the operation of various clinical equipment.
	CO5	To Associate the biochemical parameters with nutrition.

Syllabus **3 hours/week**

I. Qualitative tests

- Inorganic constituents
- Organic constituents
- Abnormal constituents
- Sugar
- Ketone Bodies
- Protein
- Bile Pigments

II. Quantitative Estimation of the following

- Hemoglobin and Iron
- Urea - Blood & urine
- Uric Acid
- Blood Glucose
- Total Protein – Albumin Globulin ratio
- Cholesterol
- Calcium- Urine
- Creatinine - Serum & Urine
- Phosphorus - Serum & Urine

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	M	M	M	H	H
CO2	L	M	M	S	H
CO3	M	H	H	H	H
CO4	H	H	S	H	S
CO5	M	H	H	S	S

S- Strong H-High M- Medium L- Low

SubCode:24PCN2CN

Programme Code: 25		**M.Sc. CLINICAL NUTRITION**		
Title of the paper: Core Practical 3: **Nutrition in Clinical Care I**				
Batch 2024 – 2025	Hours / Week 4	Total Hours 60	Credits -	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To design appropriate nutrition care plans and to calculate enteral and parenteral nutritionformulations.
2. To calculate dietary requirements for different case studies.
3. To plan diets for the dietary needs of patients based on medical conditions.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Apply nutrition care process for various diseases and disorders and calculate nutrition prescriptions- including macro and micro nutrients and plan menu for Routine hospital diets.
	CO2	To Plan therapeutic menus based on case studies of infectious diseases
	CO3	To Plan therapeutic diets for lifestyle disorders.
	CO4	To Explain dietary management of metabolic disorders.
	CO5	To Enact role play in nutrient counselling for selected diseases.

Syllabus

3 hours/week

I. Routine Hospital Diets

1. Clear Fluid Diet
2. Full Fluid Diet
3. Light Diet
4. Soft Diet
5. Bland Diet
6. Regular Diet

II. Dietary Management for Diabetes Mellitus

1. Diabetes with Obesity
2. Gestational Diabetes
3. Diabetes with CVD
4. Diabetes with Hypertension
5. Type-1DiabetesMellitus

III. Dietary Management in Cardiac Disease

1. Acute Myocardial Infraction
2. Hypertension
3. CVD with COPD
4. Hyperlipidemia
5. Congestive Cardia Failure

Sub Code:24PCN2CN

IV. Dietary Management in Liver Disorders

1. Acute Hepatitis
2. Chronic Hepatitis
3. Liver Cirrhosis
4. Hepatic Encephalopathy

V. Dietary Management in Pulmonary & Muscular- Skeletal Disorder

1. Tuberculosis and Pneumonia
2. Acute respiratorydistress syndrome
3. Gout
4. Osteoarthritis and Rheumatoid arthritis

VI. Nutrition Counselling - Case-studies and Role Play:

1. Nutrition Counselling in Prevention and management of Diabetes
2. Nutrition Counselling in Prevention and management of Coronary Heart Disease &Hypertension.
3. Nutrition Counselling in management of obesity

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	S
CO2	M	H	H	H	S
CO3	M	M	M	S	H
CO4	M	M	M	S	H
CO5	M	H	M	H	S

S- Strong H-High M- Medium L- Low

Sub Code: 24PCN308

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 8: **Nutrition in Clinical Care - II**				
Batch 2024 - 2025	Hours /Week 5	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1.To acquire knowledge on the nutrition principles and their application in disease prevention and treatment.

2.To interpret and translate the scientific knowledge and principles related to nutrition into practical meal. Planning in the preparation of therapeutic diets.

3.To prescribe appropriate diet plans for diverse disease conditions.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Understand feeding in critically ill children and able to characterize enteral and parenteral feeding and manage feeding problems arising in nutrition support
	CO2	To Apply MNT for various diseases of the lower and upper gastrointestinal problems, surgeries, renal disorders and cancer.
	CO3	To Practice nutrition care process to meet the nutritional needs for various disease condition in order to deliver effective nutrition care plans
	CO4	To Able to describe the nutrition principles of pediatric dietetics: assessment, dietary requirements and feed supplementation and pediatric problems.
	CO5	To Apply evidence-based approach in nutrition care process for various disease conditions for effective nutrition care process

Syllabus

Unit-I

Food and Nutrition Delivery - Nutritional Support (12Hours)

Enteral nutrition - Indications, enteral access - nasogastric route, nasoduodenal, nasojejunal route, percutaneous endoscopic jejunostomy (PEJ), percutaneous endoscopic gastrostomy (PEG), enteral formula composition, enteral formula categories, administration, transitional feeding, refeeding syndrome, nutrition support for long term care.

Parenteral nutrition - Indications for use of TPN, parenteral access, parenteral nutrition solutions, administration, monitoring and complications

Nutrition Therapy for Metabolic Stress: Metabolic response to stress, hormonal and cell – mediated response, nutrient assessment, head injury - nutritional support, systemic inflammatory response syndrome (SIRS), Burns — Estimation of extent of injury or sepsis, metabolic changes, nutritional support, various nutrients, Pre and post-operative nutritional care, post-surgical feedings for head and neck surgeries.

Sub Code: 24PCN308

Unit-II **(12 Hours)**

Nutrition Therapy for Upper Gastrointestinal Tract Disorder

Oesophagus - Esophagitis/ esophageal reflux syndrome/ achalasia-stomach-dyspepsia, hiatus hernia, hypochlorhydria, acute and chronic gastritis peptic ulcer, and gastric ulcer.

Nutrition Therapy for lower gastrointestinal tract disorders: Intestines - Flatulence, constipation (atonic, spastic and obstructive), diarrhoea (acute and chronic), steatorrhoea colon - inflammatory bowel disease - crohn's disease, ulcerative colitis, irritable bowel syndrome, short bowel syndrome, diverticular disease- diverticulosis, diverticulitis, tropical sprue, polyps, fissures. Post-operative feedings for gastric, intestinal surgeries and cholecystectomy

Unit – III **(12 Hours)**

Nutrition therapy for Pediatrics

Medical Nutrition Therapy for low-birth-weight infants - Basic needs and plans of nutritional care of the hospitalized infant –nutritional assessment and growth, selection of Enteral and Parenteral feeding. Special infant needs, underweight & failure to thrive, Childhood overweight &obesity: Nutrition assessment, dietarymodification and recommendation.

Medical Nutrition Therapy for Genetic metabolic disorders: Inborn Errors of Metabolism Phenyl ketonuria, Lactose Disorders of carbohydrate metabolism: galactosemia, fructose intolerance, glycogen storage disorders, Role of nutrition in genetic metabolic disorders

Unit- IV **(12 Hours)**

Medical Nutrition Therapy for Renal Disorders Nephrotic Syndrome, pyelonephritis, acute kidney injury (acute renal failure), chronic kidney diseases (chronic renal failure), Nutrition management of nephrotic syndrome AKI & CKD. Types of dialysis, renal calculi- types and role of diet; urolithiasis, end stage renal disease, transplantation

Unit – V **(12 Hours)**

Medical Nutrition Therapy for Cancer

Types, stages, Pathophysiology etiology, clinical manifestation, medical and dietary management, nutritional effects of cancer therapy, pediatric cancer, nutrition and carcinogens and nutrition therapy forCancer Survivors.

Teaching Methods

Smart Class Room/PowerPoint presentation/Seminar/Quiz/Discussion/Flipped Class/Case studies/*Self - Study

References:

1. Krause, Food, Nutrition and Diet therapy, 2012, 12th edition, W.B. Saunders Company.
2. Ganongs. W.F; Review of medical physiology, 1985.
3. Campbell. E.J et al; Clinical and applied physiology,1984.
4. Guyton AC and Hall JB; Textbook of medical physiology, 1996.
5. Guyton AC; Functions of human body, 1985.
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7. Judith E. Brown., Nutrition New, 2nd edition, West / Wadswroth west / Wadsworth,
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9. Clinical Dietetics and Nutrition – F P Anita and Philip Abraham.
10. Food, Nutrition and Diet Therapy – Kathleen Mahan & Krause, Sylvia EscottStump.
11. Normal and Therapeutic Nutrition – Robinson & Lawler, 17th edition, Mac MillanPublishers.
12. Clinical Nutrition – Ed Michael J Gibney, MarinosElia, OlleLjungqvist and JulieDowsett.
13. Nutrition in Clinical Practice – David L. Katz, Lippincott, Williams & Wilkins.
14. Text Book of Human Nutrition – Mahtab S Bamji, N PrahladRao, Vinodini
15. Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd.
16. Modern Nutrition in Health & Disease – Eds – Maurice E. Shils, James A.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	M	H	M	S	S
CO2	M	H	L	H	S
CO3	M	H	L	H	S
CO4	H	H	M	H	S
CO5	M	H	H	S	S

S- Strong H-High M- Medium L- Low

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Paper 9: **Nutraceuticals and Drug-Nutrient Interaction**				
Batch 2024 -2025	Hours /Week 5	Total Hours 6 0	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the basic pharmacokinetic concepts of the absorption, distribution, metabolism and excretion of drugs.
2. To learn about the potential drug-nutrient interactions.
3. To understand the importance of drug-nutrient interactions and the relationship between disease and nutritional status

Course Outcomes (CO)

On Successful Completion of the Course, the students will be able

K1 To K5	CO1	To Understand the principles of nutraceuticals and functional foods.
	CO2	To Define the basic concepts of pharmacokinetic and pharmaco dynamicactions of drugs.
	CO3	To Associate the food interactions with pharmacokinetic and pharmacodynamic actions.
	CO4	To Relate drug nutrient interaction with special nutrition support.
	CO5	To Understand the impact of pharmaceuticals on nutritional status

Syllabus

Unit-I **(12 Hours)**

Introduction to Nutraceuticals

Definition, classification, differentiation between Nutraceuticals and functional foods, functional components in food, role of functional components in nutrient deficiency and disorders. Approval process for Nutraceuticals in India and USA*.

Drug disposition and Response - Routes of administration, absorption, distribution, metabolism and elimination, pharmacokinetics, pharmacodynamics –mechanism of action, receptors, signal transduction.

Unit-II **(12 Hours)**

Overview of Drug Nutrient Interactions -Classification and mechanism of drug nutrient interactions**,** physiological and physiochemical interactions influencing drug interactions/absorption, Interaction between nutrient &nutrient – Macro nutrients and micronutrients, dietary supplement interactions with drugs, Food – Drug interaction Education - Priority to food - drug counseling.

Sub Code: 24PCN309

Unit-III **(12 Hours)**

Influence of Pharmaceuticals on Nutritional Status -Cardiac drugs on nutritional status, Antihypertensive drugs and nutritional status– beta blockers, ACEInhibitors & Angiotensin receptor blockers, Calcium channel blockers, Vasodilators and anticoagulants

i) Antiepileptic drugs on nutritional status,

ii) Diuretics and its interactions.

iii) CNS disorders - Pain Killers, Alcohol, General anesthetics and Sedatives on nutritional status

iv) Antacids, anti-ulcer drugs, purgatives and antiemetics on nutritional status.

v) Hormone related drugs - Growth hormone, Thyroid hormone, Corticosteroids on nutritional status

vi) Oral diabetic drugs and Insulin on nutritional status.

Unit- IV **(12 Hours)**

Drug Nutrient Interactions in Specific Conditions - Drug nutrient interactions in patients with cancer, Drug nutrient interactions in transplantation, Drug nutrientinteractions and immune functions, Drug nutrient interactions in patients with chronic infections microbial – nutrient interactions – an overview

Unit-V **(12 Hours)**

Drug Nutrient Interaction in Special Nutrition Support -Drug nutrient interaction in enteral nutrition n ut r a c eu t i c a l s , functional foods, elemental and hydrolyzeddiets. Drug nutrient interaction in parenteral nutrition – commercial formula; Role of probiotics

Teaching Methods

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion/Flipped Class/*-Self - Study

References:

1. Joseph I. Boullata and Vincent T. Armenti, Handbook of Drug Nutrient Interactions, Humana Press, Nutrition and health (Totowa, N.J.), New York, NY, 2010.
2. Robert E.C. Wildman, Handbook of Nutraceuticals and Functional Foods, 2nd Edition, CRC Press, New York. 2007,
3. TripathiKD., Essential of Medical Pharmacology, 6th Edition, JKB brothers andDistributors, Chennai, 2008,
4. Katzung, B.G, Basic and Clinical Pharmacology, 10th Edition, Mc Graw Hill Publications,Delhi, 2007
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6. Bennet P.N, Clinical Pharmacology, 10th Edition, Churchill Livingston (Elsevier) Publications, Philadelphia, 2008.

Sub Code: 24PCN309

7. S.P. Maity and R.N. Chatterjee, Pharmacology, 5th Edition, Booksand Allied (P) Ltd., Calcutta, 2006.
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9. Betram G. Katzung Susan B. Masters, Anthony J. Trevor, Basic and Clinical Pharmacology, 11th Edition, McGraw Hill Professional, Delhi, 2009
10. Klaus Kramer, Peter-Paul Hoppe, Lester Packer, Nutraceuticals in Health and Disease Prevention
11. Peter N. Bennett, Morris J. Brown, Pankaj Sharma, Clinical Pharmacology, 10th edition, Churchill Livingston (Elesiever) publications, Philadelphia. 2009.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	M	M
CO2	S	S	M	S	L
CO3	H	S	S	H	M
CO4	S	H	M	H	M
CO5	H	M	M	H	H

S- Strong H-High M- Medium L- Low

Sub Code: 24PCN310

Programme Code: 25		**M.Sc. CLINICAL NUTRITION**		
Title of the paper: Core Paper 10: **Sports and Fitness Nutrition**				
Batch 2024 –2025	Hours /Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To understand the principles of sports, exercise and fitness and nutritional requirements of competitive and recreational athletes.
2. To learn about energy balance, weight control and eating disorders in athletes.
3. To understand the importance of physical fitness in the management of common abuses.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Learn the principles of wellness and fitness
	CO2	To Describe oxidative stress in athletes, nutrient requirements and supplements for sports activities.
	CO3	To recognize the importance of lifestyle management in drug abuse smoking and alcoholism
	CO4	To Understand weight management, energy balance and nutrition for special Population
	CO5	To acquire knowledge on the importance of nutrition for high altitude and spacetravel.

Syllabus

Unit- I **(12 Hours)**

Introduction to physical fitness & wellness - Objective of physical fitness, motivation for a physically active life – motivational strategies. Types of exercise, effect of exercise on muscular, skeletal, cardiovascular and respiratory activities, muscular and cardiopulmonary adaptation to exercise. Energy system – Aerobic & Anaerobic, PAL (Physical Activity Level) equation.

Unit- II **(12 Hours)**

Nutrition in Exercise -Preparation for competition,* Pre-games meal, carbohydrate loading, pre-exercise hydration, post-game meal. Nutrition during exercise / games –carbohydrate intake, protein, fat and fluid intake. Nutritional factors causing fatigue, fluid replacement, dietary supplements and ergogenic aids in sports.

Unit- III **(12 Hours)**

Oxidative stress and antioxidant requirements in athletes -Oxidative stress, antioxidant defense, oxidative stress in exercise, importance of antioxidants in a diet, stress management techniques.

High Altitude Nutrition - Acclimatization, hydration, nutritional problems and altitude sickness and dietary management.

Space travel and nutrition – Space physiology, food system and dietary intake for space

Sub Code: 24PCN310

Unit- IV-Nutrition and regulation of body weight (12Hours)

Energy balance, Regulation in Energy Imbalance, overweight and obesity, Excessive leanness, bulimia-Underweight and anorexia nervosa, sleep apnea. Nutritional management and physical exercise, Nutrition counselling in the management of obesity.

Nutrition for special population–special nutritional considerations for child athletes, teen age athletes, pregnant athletes and athletes with diabetes

Unit- V Physical fitness and life style management (12 Hours)

smoking and alcoholism and drug addiction: Drug – Consequences of use, misuse and abuse, tolerance, dependence and addiction, legal drugs, psychoactive and vasoactive substances – occurrence, etiology, pathology and treatment, health related issues due to excessive exercising.

Hands on Training – Role play

1. Estimation of daily calorie requirement
2. Practical application of nutrition counselling for Athletes, Nutrition counselling in regulation of body weight

Teaching Methods

Smart Classroom/PowerPoint presentation/Seminar/Quiz/Discussion/Flipped Class/*Self-Study

References

1. Krause Food, Nutrition and Diet therapy,12th edition, W.B.Saunders Company, 2012.
2. Kathleen Mahan L., Janice L. Raymond, Krause's Food & The Nutrition Care Process, Fourteenth Edition , 978-0-323-34075-5, 2017.
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7. Driskell JA and Wolinsky I. Nutritional Assessment of Athletes. 2nd Ed. CRCPress, Boca Raton. 2011.
8. Jeukendrup A. Sports Nutrition from Lab to Kitchen. Meyer &Meyer Sports, Garsington, 2010.
9. Maughan R. . Sports Nutrition. The Encyclopedia of Sports Medicine. An IOC Medical Commission Publication. Willy Blackwell,West Sussex. 2014

Mapping

CO \ PSO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	L	M	M	H	S
CO2	M	H	H	H	H
CO3	S	M	L	H	H
CO4	S	H	H	H	S
CO5	M	M	H	H	H

S- Strong H-High M- Medium L- Low

Sub Code: 24PCN311

Programme Code:25	**M.Sc. CLINICAL NUTRITON**			
Title of the paper: Core Paper 11: **Clinical Health Psychology**				
Batch 2024 -2025	Hours /Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the fundamentals of Clinical Health Psychology.
2. To understand the perspectives of health illness and behavior.
3. To acquire skills on stress management techniques and therapeutic counselling

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Understand the need and perspectives of health psychology and effects of bio, psycho, and social factors on a person's health.
	CO2	To Acquire knowledge about the influence of stress on health and the importance of coping and managing stress.
	CO3	To Recognize the nature and significance of pain and its management.
	CO4	To Apply the counselling skills for intervention on people with chronic and terminal illness.
	CO5	To Develop Specific Competencies in Clinical Psychology.

Syllabus

Unit-I **(12 Hours)**

Introduction to Health Psychology -Health Psychology: Definition – Need for Health Psychology – Overview of the Systems of Body-Current Perspectives on Health and Illness: Bio-Psycho-Social-Life Span and Gender Perspective-Health related behavior and Health Promotion

Unit-II **(12 Hours)**

Stress, Illness and Coping -Stress: Meaning-Types- Bio-psycho-social aspects of stress – Sources-GAS Model of Stress- Effects on Health – Psycho-physiological disorders-Coping with stress-Management of stress

Unit-III **(12 Hours)**

Pain and Its Management -Pain: Meaning- Nature and Significance of Pain Managing and Controlling Clinical Pain: Clinical Pain-Behavioral and Cognitive methods for treating pain-Hypnosis

Sub Code: 24PCN311

Unit-IV **(12 Hours)**

Counselling -Counselling: Meaning- Types – Counselling Process Skills of an Effective Counsellor-Therapeutic Counselling: Psycho-social interventions for people with chronic conditions-Counselling for terminally ill.

Unit-V **(12 Hours)**

Psychological Intervention - Psychotherapy: Meaning- Various Approaches: Behaviour Therapy-Bio-feedback-Rational Emotive Therapy– Psychoanalytic Therapy-Existential therapy – Client Centered therapy – Expressive Therapy-Music therapy.

Teaching Methods

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion/Flipped Class/ Demonstration and mock counselling/*-Self - Study

References:

1. Sarafino, E. P. Health Psychology-Bio-psycho-social Interactions (7º Edition), New Delhi: 2.Wiley India (P) Ltd, 2012.
2. Linda Brannon & Jess Fest: Introduction to Health Psychology, NewDelhi Cengage, Leaming India (P) Ltd: 2010
3. Shelley C Taylor Health Psychology. (6 Edition), New York: Tata McGraw Hill Publication
4. .Catherine A Sanderson Health Psychology, New York. Jahn Wiley & Sons Inc. 2006

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	S	M	L	H	M
CO2	S	M	M	S	S
CO3	S	M	H	S	H
CO4	S	M	H	S	H
CO5	S	M	M	H	L

S- Strong H-High M- Medium L- Low

Sub Code:24PCN3CN

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Core Practical 3: **Nutrition in Clinical Care – II**				
Batch 2023 –2025	Hours /Week 5	Total Hours 60	Credits 5	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To design appropriate nutrition care plans and to calculate enteral and parenteral nutrition formulations.
2. To calculate dietary requirements for different case studies.
3. To plan diets for the dietary needs of patients based on medical conditions.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Apply nutrition care process for various diseases and disorders and calculate nutrition prescriptions- including macro and micro nutrients and plan menu for routine hospital diet.
	CO2	To Plan therapeutic menus based on case studies of life style diseases namely obesity, hyperlipidemia, CVD, Diabetes Mellitus, COPD, Cancer and Musculo-skeletal disorders.
	CO3	To Plan therapeutic diets for GI tract diseases and liver disorders.
	CO4	To Explain dietary management of Genito urinary system and pediatric care.
	CO5	To Enact role play in nutrient counselling for selected diseases.

Syllabus

Unit I Diet for Critically Ill & Trauma Patients

1. Ryle's tube feeding for critically ill patients
2. Diet for head injury
3. Diet for pre and post
4. Diet for Burns
5. Surgery
6. Bowel Resection of Gastric region, cancer, Brain and Heart surgeries

Unit II Dietary Management in Gastro Intestinal Tract Disorders

1. GERD with CVD
2. GERD with Diabetes
3. GERD in Elderly

Sub Code:24PCN2CN

4. GERD with Cholelithiasis
5. Acute Pancreatitis
6. Irritable Bowel Syndrome
7. Diverticulosis

Unit III Dietary management in Pediatrics

1. GERD in pediatrics
2. Infantile Diarrhea
3. Phenyl Ketonuria
4. Childhood Obesity
5. Failure to Thrive

Unit IV Dietary Management in Genitourinary System Disease

1. Nephrotic syndrome
2. Acute kidney Injury
3. Chronic kidney Diseases
4. Urolithiasis (Renal Calculi)

Unit V Nutrition Therapy for Cancers

1. Pediatric cancer
2. Gastro intestinal cancer - Colon, Small intestine, Rectum
3. Cancer and cachexia
4. Head and neck cancer
5. Breast cancer
6. Lung cancer

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	S
CO2	M	H	H	H	S
CO3	M	M	M	S	H
CO4	M	M	M	S	H
CO5	M	H	M	H	S

S- Strong H-High M- Medium L- Low

Sub Code: 24PCN4Z1

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: **Hospital Internship & Project**				
Batch 2024 –2025	Hours /Week 30	Total Hours 450	Credits 8	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To enable the students to understand medical case and dietetic care notes.
2. To learn preparations and administration of special nutrition support.
3. To acquire skills on nutritional screening, assessment, a n d basic individual and group counseling Skills.

Course Outcomes (CO)

On Successful Completion of the Course, the Student will be able to

K1 to K5	CO1	To Assess the nutritional status of patients in hospitals.
	CO2	To Develop nutrition counselling skills for patients using appropriate modes of approach.
	CO3	To Learn Medical Nutrition Therapy for dietary management of diseases.
	CO4	To Plan suitable menu based on nutrient requirement of various disease conditions.
	CO5	To Participate and interact in nutrition education seminars and workshops.

Syllabus

The hospital posting is divided into rotations with specific performance objectives and learning experiences.

1. Induction

During induction the students are provided with an opportunity to become familiar with a Health care team they will work with and understand the importance multidisciplinary approach towards the patients.

2. Nutrition Assessment –Nutrition Intervention

The students exposed for incorporate nutrition care process practical application such as Nutritional Assessment, diagnosis, intervention, monitoring and evaluation for a variety of disease states of inpatients and outpatients under the direction of clinical dietitians.

3. Foodservice Systems Menu Planning

This rotation provides experiences for the students in the areas of personnel, menu planning, foodservice systems and communication. Menu planning does observation in hospital foodservice

4. Education

Participation in Continuous Nutrition Education (CNE), seminars and training opportunities. Preparation of educational resources for various disease conditions.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	M	H	H
CO2	L	H	H	S	H
CO3	S	H	M	H	H
CO4	H	H	S	H	H
CO5	L	M	M	H	M

S- Strong H-High M- Medium L- Low

Sub Code: 24PCN4Z2

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: **Project and Viva-voce**				
Batch 2024 –2025	Hours /Week 30	Total Hours -	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1.Dissertation/Project work should be carried out as an individual Dissertation

2.The students will carry independent project work under the supervision of the staff of Department on an advanced topic.

3. Inhouse projects are encouraged.

Course Outcomes (CO)

On Successful Completion of the Course, the Student will be able to

K1 to K5	CO1	To Understand and apply advanced research methodologies and techniques relevant to their field of study.
	CO2	To Conduct independent research and develop a comprehensive dissertation/project under supervision
	CO3	To Demonstrate the ability to perform actual bench work and practical experiments related to their Clinical aspects.
	CO4	To Effectively present and defend their research findings in a format presentation and viva-voce
	CO5	To Collaborate with internal and external evaluators to improve the quality and impact of their research work.

Syllabus

1. Dissertation/Project work should be done as a separate dissertation and actual bench work.

2. The Dissertation/Project work will begin from 2nd Semester, and will continue through the 3rd Semester.

3. The Dissertation/Project report (also report will be presented at the time of presentation and viva voce) will be submitted at the end of the 4th Semester and evaluated.

4. Three copies of the project report shall be submitted to the Exam Cell.

5. The evaluation of Dissertation/Project work will be done by the External Examiners.

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO 5**
CO1	H	S	S	H	S
CO2	S	S	M	H	S
CO3	S	H	H	H	S
CO4	S	S	M	S	S
CO5	S	M	L	S	M

S- Strong H-High M- Medium L- Low

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**
Title of the paper: Major Elective Paper**: Medical Microbiology**	

PCN 30

Batch	Hours / Week	Total Hours	Credits	Employability/Skill
2024 – 2025	5	75	5	Development/ Entrepreneurship

Course Objectives

- To acquire knowledge on the morphology of micro-organism.
- To understand the pathogenicity of micro-organism.
- To identify suitable prophylaxis and treatment for infectious diseases

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 **to** K5	CO1	To Identify and describe morphological and cultural characteristics of the pathogenic organisms.
	CO2	To Explain the mechanism by which an infectious agent causes disease
	CO3	To Recall the methods used to identify the pathogens
	CO4	To Assess treatment strategies for infectious diseases
	CO5	To Understand the prophylactic measures against infections.

Syllabus

Unit I **(15 Hours)**

Basics and Morphology

Morphology of Bacteria, Viruses, Fungi and Parasites Control of microorganisms-control of microorganisms by physical and chemical agents, antibiotics and other chemotherapeutic agents. Immunology– Definition, types of immunity, diagnosis and therapeutic uses.

Nosocomial Infections

Burns, wounds, bacteremia, and UTI (Both Lower & Upper) – causative agents, clinical features, laboratory diagnosis, prophylaxis, and treatment.

Unit II **(15 Hours)**

Respiratory Infections

Chicken pox, Influenza, Measles, Streptococcal diseases, Tuberculosis, – causative, pathogens, clinical features, laboratory diagnosis, prevention, and treatment.

Unit III **(15 Hours)**

Intestinal Infections

Virus – Viral gastro enteritis (Rotovirus), Hepatitis A - E, Poliomyelitis - causative pathogens, clinical features, laboratory diagnosis, prevention and treatment. **Parasites*** – Amoebiasis, Giardiasis, tapeworm and round worm infections – causative, pathogens, clinical features, laboratory diagnosis, prevention and treatment.

Unit IV **(15 Hours)**

Intestinal Infections

Bacteria – Cholera, Shigellosis, Staphylococcal food poisoning, Traveler's diarrhea, Typhoid fever, Botulism, Campylobacter jejuni, Gastro enteritis – causative, pathogens, clinical features, laboratory diagnosis, prevention and treatment.

Unit V **(15 Hours)**

Malaria, Filariasis, Meningitis, Endocarditis, Dengue, Chikungunya, H1N1, Leptospirosis, HIV, Cysticercosis, Osteomyelitis, Skin infection, Fungal disease – opportunistic and superficial mycoses, causative, pathogens, clinical features, laboratory diagnosis, prevention and treatment.

Teaching Methods

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Classroom/*Self - Study

References

1. Anantha Narayanan R and JayaramPanikar C.K., 2008, Textbook of Microbiology,8th Edition, Published by Universities Press India, Hyderabad.
2. Arora DR and Arora BB.,2008, Textbook of Microbiology, CBS Publishers and Distributors Pvt.Ltd, Delhi.
3. Micheal J Pelczar JR, Chan ECS, Noel R. Krieg, 2010, Microbiology, 5th edition, TataMcGraw-Hill, New York.
4. Joanne M Willey, Linda M Sherwood and Christopher J. Woolverton, 2016, Prescott's Microbiology, 10th edition, McGraw Hill Education.
5. JayaramPanikar C. K., 2013, Text book of Parasitology, Seventh Edition, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.
6. Arora DR and Arora BB, 2012, Medical Parasitology, 3rd edition, CBS Publishers andDistributors Pvt.Ltd, Delhi.
7. Jawetz, Melnick&Adelberg, 2007, Medical Microbiology,24th Edition, McGraw-Hill, NewYork.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	L	H	L
CO2	S	S	M	M	M
CO3	M	S	H	S	H
CO4	S	S	H	M	H
CO5	S	S	H	S	H

S- Strong **H-High** **M- Medium** **L- Low**

Programme Code: 25	M.Sc. CLINICAL NUTRITION			
Title of the paper: Major Elective Paper**: Food Microbiology**				
Batch 2024 – 2025	Hours / Week 5	Total Hours 75	Credits 5	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge of the nature and physiology of micro-organisms in foods.
2. To learn about microbial contamination of foods and food borne diseases.
3. To understood the importance of food sanitation.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Explain the interactions between microorganisms and the food spoilage.
	CO2	To Understand microbial spoilage and relate it to nutrient degradation
	CO3	To Describe the characteristics of food borne spoilage organisms and disease outbreaks in the community.
	CO4	To Role of microbial techniques in waste management and sanitation system.
	CO5	To Understand the microbial growth pattern.

Syllabus

Unit I **(15 Hours)**

Types of microorganism associated with food – Mold - general characteristics, morphological features and biochemical activities, common molds associated with foods.

Bacteria–Morphological and biochemical activities, important food spoilage and pathogenic bacteria, associated with foods. List of infection by bacteria.

Yeast- General Characteristics, reproduction, cultural characteristics and biochemical activities, List of infection by yeast. **Viruses**- Structure and replication with particular reference to food born viruses, List of infection by virus.

Biochemical changes caused by microorganisms–Degradation of carbohydrates, fermentation, degradation of lipids, degradation of proteins and amino acids, putrefaction.

Unit II **(15 Hours)**

Microbial growth pattern– Growth curve of microbial cultures, its application to food preservation.

Factors affecting microbial growth– pH, moisture content, Eh, nutrient content, antimicrobial constituents, biological structures, extrinsic factors.

Control of microbial growth in foods–High temperature, freezing, refrigeration, chemical preservatives,irradiation.

Unit III **(15 Hours)**

Microbial contamination and spoilage of foods– Vegetables, cereals, pulses, oilseeds, milk and meat during handling, processing and storage

Microbiology of water - Microbiological quality of water. Analysis of water.

Spoilage of processed foods – Canned products, causes of spoilage, appearance of spoiled cans, types of spoilage of canned foods by yeast, moulds and bacteria.

Unit IV **(15 Hours)**

Food borne diseases – Staphylococcal gastroenteritis, Botulism, Listeriosis, Salmonellasis, Shigillosis.
Toxicants of microbial origins – Aflatoxins, ochratoxins, patulin, botulism, enterotoxins.
Detection of food borne pathogens - Physical, chemical and immunological methods of detecting microbes in foods with special reference to Staphyllococcus, Clostridium, Lysteria, Yersenia, Salmonella, Escherichia, Vibrio.

Unit V **(15 Hours)**

Microbes in biotechnology- useful microorganisms, fermented foods, organisms and product obtained,benefits of fermentation.
Microbiology in Food Sanitation – Bacteriology of water; sewage and waste treatment and disposal; good manufacturing Practices; HACCP; Microbiological criteria for foods; Control Agencies.

Teaching Method

Power Point Presentation/Seminar/Quiz/Discussion/Assignment/Google Class /*Self - Study

References

1. Frazier W C and Westhoff D C, 2017, 5th edition, Food Microbiology, MaGraw Hill Inc.
2. Jay James M, 2006, 7th edition, modern Food Microbiology, Springer
3. Peleezar MI and Reid K D, 2001, 5 th edition Microbiology, McGraw Hill Company, New York.
4. Benson Harold J ,1998, Microbiological Application, Publishers, Mcgraw hill college
5. Colling C E and Lyne PM, 1976, Microbiological Methods Butterworth. London.
6. George J Banwart 2004, 2 nd edition CBS Publishers & Distributors
7. Pelezar, M J and Chan E C S (Jr), 2000, Microbiology, Tata McGraw Hill Pub. Co., New Delhi
8. G K Pal &Parvati Pal, 2010, Textbook of Practical Physiology (New), India
9. Stanier R Y, Adelberg E A and Ingraham J L, 1987, General Microbiology, 5th Edition. Macmillan Press Ltd

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	L	H	L
CO2	S	S	M	M	M
CO3	M	S	H	S	H
CO4	S	S	H	M	H
CO5	S	S	H	S	H

S- Strong H-High M- Medium L- Low

Programme Code:25	M.Sc. CLINICAL NUTRITION			
Title of the paper: Major Elective Paper: **Food Service Management**				
Batch 2024 – 2025	Hours / Week 5	Total Hours 75	Credits 5	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the principles of food service management from market to table.
2. To earn the applications of purchasing, receiving, storage and inventory of food service institutions.
3. To learn the skills of menu planning for quantity food production.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Discuss the principles of food service management
	CO2	To Describe the components of food service establishment.
	CO3	To Apply the principles of food microbiology for food safety, sanitation and hygiene.
	CO4	To Recognize the importance of human resource management personnel in food service establishment.
	CO5	To Learn the financial aspects of a food service establishment.

Syllabus

Unit I **(15 Hours)**

Management and Food Service Planning: Theories, principles and functions of management; Tools of management; Strategy of effective management; History of food services; Traditional food service system; Commercial and non-commercial food service units. Innovations in food service systems; Food service planning & management; Catering Establishment Act; Food laws; Computer aided record maintenance and management.

Unit II **(15 Hours)**

Human Resource management Personnel: Development and policies; administrative personnel; labor policies and legislation; human resource planning; recruitment, selection, induction training and development; Performance Evaluation Employee facilities and benefits. Leadership qualities of manager.

Entrepreneurship: Conceptual Perspective of Entrepreneurship, Characteristics of Successful Entrepreneurs, Developing the Business Plan, Entrepreneurship Development and Training, Merchandising Skills, Marketing strategies

Unit III **(15 Hours)**

Quantity Food Production and Service

Menu - meaning, types, points to be considered while planning the menu, compiling simple menus; purchasing, receiving, storing and issuing of foods; food production methods; food production control; methods of food control; food control check list; food service methods and modes of delivery. Visit to Food Service Industries

Unit IV **(15 Hours)**

Physical Facilities

Equipment: Determining equipment, selection, purchase, placement and maintenance of equipment.

Layout of Facilities: Steps in planning layouts; Feasibility and design for food service operations – space allowances and relationships, schematic drawing and work areas importance of flooring and lighting in food service units

Unit V **(15 Hours)**

Accounting and Records and Safety measures

Finance: Financial planning, financial operations - a system of records and reports; Computer aided record maintenance, cost control - food cost control, labor cost control and overhead cost control.

Books Keeping: Journal, ledger, trial balance, balance sheet, profit and loss account. **Sanitation and Hygiene*:** Food hygiene, personal hygiene, environmental hygiene and sanitation.

Safety: Accidents-prevention and training, Fire safety measures, Hazard Analysis Critical Control Point (HACCP),FSSAI.

Teaching Method

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Class/*Self - Study

References:

1. Mohini Sethi, Surjeet Malhar, Institutional Food Management; 2016, New AgeInternational,
2. New Delhi.
3. Sethi M and Mahan S (Revised 2nd edition, 2007)). Catering Management, An Integrated
4. Approach. New Age International (P) Ltd
5. .Andrews S (2009) Food and beverage service : Training Manual 2nd edition. New Delhi
6. Tata McGraw Hill.
7. .Bessie Brooks West and Levelle Wood MS (1988). Food Service in Institutions (6th ed.).
8. John MacMillan Publishing Co., New York
9. 5 .Harris N (1984) Meal management (6th ed.). New York : Mac Mill

Mapping

CO / PSO	PSO1	PSO 2	PSO3	PSO4	PSO5
CO1	L	M	M	H	H
CO2	M	M	M	H	H
CO3	M	M	M	H	H
CO4	M	M	L	H	M
CO5	M	L	M	H	S

S- Strong **H-High** **M- Medium** **L- Low**

Programme Code:25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Major Elective Paper: **Health Care Management**				
Batch 2024 – 2025	Hours / Week 5	Total Hours 75	Credits 5	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the responsibilities of hospital administrators
2. To gain insight on the various aspects of health care and hospital management.
3. To identify the current issues in health care management and their remedies.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 **to** K5	CO1	To Recognize the clinical services of food service system.
	CO2	To Understand the management principles and the system approach in hospital food service System
	CO3	To Recognize the approaches and working of the various committees in hospital administration.
	CO4	To Keep abreast with the current types of dietary care in hospital setting
	CO5	To Describe the characteristics of food service system in food production and health care.

Syllabus

Unit I **(15 Hours)**

Hospitals in India

History of Indian Hospitals; Classification, organization and Functions of Hospitals; Role of health services in improving health; Planning a modern hospital – location, market survey, financial planning, minimum requirements, bed distribution, constructional and staff requirement

Unit II **(15 Hours)**

Hospital Administration

Hospital administrator – role, functions, skills and legal matters*; Role and responsibilities of CEO, HODs of HR, Finance, Nursing, Emergency medical services, Stores, Dietetics,Public Relations Office, Information Office.

Hospital Committees Administrative, Medical Board, Medical Ethics and Legality, Medical Audit, Infection Control, Hospital Advisory Committee.

Unit III **(15 Hours)**

Hospital Management – Principles*, Practice, Modern Techniques, Strategic Planning Process; Management by objectives - Basic ingredients, Process, concept and advantages **Legal Aspects of Health Care –** Patient and Consumer Protection Act, 1986; RTI 2005; The Prenatal Diagnostic Techniques Act, 1994; Transplantation of Human Organs Act,1994; Biomedical waste Management and Handling Rules, 1998; MTP Act 1971,2002; **Accreditation-** Definition, Advantages, list of organizations ISO, JCI, NABH

Unit IV **(15 Hours)**

Medical Records - Characteristics, functions, components, Technology advancement – EMR, Microfilming and smart cards; legal aspects of medical records. Standard Operating manual for Patient Care & Health Professionals- Emergency Department, ICU, OPD, IPD and Dietary**.**

Unit V **(15 Hours)**

Current Issues in Healthcare – Telemedicine; Health Tourism; Health Insurance; Biomedical waste management – types of waste, health hazard, color coding, disposal of waste; Disaster management

Teaching Method

Power point presentation/Seminar/Quiz/Discussion/Assignment/Google Class/*Self - Study

References:

1. Sharma DK and Goyal RC, Hospital Administration and Human Resource Management, PHI Learning Private Limited, New Delhi, Fifth Edition, 2010.
2. Syed Amin Tabish, Hospital and Health Services Administration – Principles and Practice, Oxford University Press, New York, Fourth Edition, 2011.
3. Kieran Walshe and Judith Smith, Health Care Management, Tata McGraw Hill Education Private Limited, New Delhi, First Edition, 2010.
4. Srinivasan AV, Managing a Modern Hospital, Response Books, New Delhi, Second Edition, 2008.
5. Joy deep Das Gupta, Hospital Administration and Management – A Comprehensive Guide, Jaypee Brothers Medical Publishers – (P) Ltd, New Delhi, First Edition, 2009.
6. Stephen P. Robbins and Mary Coulter, Management, II edition, Prentice Hall ofIndia Pvt. Ltd., New Delhi, 2009.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	H	H	H
CO2	L	M	M	H	S
CO3	M	M	H	H	H
CO4	M	H	H	S	S
CO5	M	H	M	H	H

S- Strong H-High M- Medium L- Low

Programme Code: 25	M.Sc. CLINICAL NUTRITION			
Title of the paper: Non-Major Elective Paper: **Information Security**				
Batch 2023-2024	Hours/Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. Students will identify the core concepts of Information security.
2. To examine the concepts of Information Security.
3. To design and implement the security features for IT and Industrial sectors.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Learn the principles and fundamentals of information security.
	CO2	To Demonstrate the knowledge of Information security concepts
	CO3	To Understand about Information Security Architecture.
	CO4	To Analyze the various streams of security in IT and Industrial sector.
	CO5	To know about Cyber Laws and Regulations.

Syllabus

Unit I **(12 Hours)**

Information Security basics: Definition of Information Security - History of Information Security - Characteristics of Information Security - Components of Information Security - Security System Development Life Cycle (SDLC).

Information Security for technical administrators: Server Security – Network security- Social Media Security.

Unit II **(12 Hours)**

Cryptography: Basic concepts - plain text - Cipher text - Encryption Principles - CRYPT Analysis - Cryptographic Algorithms - Cryptographic Tools – Authentication -Biometrics* - passwords - Access Control Devices - Physical Security - Security and Personnel.

Language-based Security: Analysis of code for security errors, Safe language and sandboxing techniques.

Unit III **(12 Hours)**

Firewalls, Viruses & Worms & Digital Rights Management: Viruses and Worms-Worms - Digital Rights Management – Firewalls - Application and Circuit Proxies - Stateful Inspection - Design Principles of Firewalls.

Logical Design: Access Control Devices- Physical Security-Security and Personnel - NIST Models- VISA International Security Model- Design of Security Architecture-Planning for Continuity.

Unit IV **(12 Hours)**

Hacking : Introduction – Hacker Hierarchy – Password cracking – Phishing - Network Hacking - Wireless Hacking - Windows Hacking - Web Hacking*- Ethical Hacking.

Security Investigation: Need for Security- Business Needs-Threats- Attacks- IP Addressing and Routing - Social Media

Unit V **(12 Hours)**

Cyber Laws : What is Cyber Law? - Need for Cyber laws - Common Cyber Crimes and Applicable Legal Provisions: A Snapshot - Cyber Law (IT Law) in India – The Information Technology Act of India 2000 - Cyber Law and Punishments in India - Cyber Crime Prevention guide to users – Regulatory Authorities.

***Self study questions for examination may be taken from the self-study portions also.**

Teaching Methods:

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion/Flipped Class/ demonstration and mock counselling

Text Book:

Information Security –Textbook prepared by KONGUNADU ARTS AND SCIENCE COLLEGE, Coimbatore -29, 2022.

Reference

1 Charles P Pfleeger and Shai Lawrence Pfleeger, **"Security in Computing",** Fourth & Third Edition, Prentice Hall, 2007 & 2011.

2 Ross J. Anderson and Ross Anderson, "Security Engineering: A guide to building Dependable Distributed System", Wiley,2009.

3 Thomas R. Peltier, Justin Peltier and John Bleckley, "Information Security Fundamentals",2nd Edition, Prentice Hall 1996.

4 Gettier, Urs E. Information Security: Strategies for Understanding and Reducing Risks John Wiley & Sons, 2011.

5 "Principles of information security". Michael Whiteman and Herbert J. Mattord,2012.

6 Information security -Marie wright and John kakalik,2007.

7 Information security Fundamentals- Thomas R. Peltier, Justin Peltier and John Blackley-2005.

8 Information Security theory and practical PHI publication, Dhiren R. Patel-2008.

9 Debby Russell and Sr.G.T. Gangemi," computer Security Basics,2nd edition, O'Reilly Media,2006.

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	M	H	S	S
CO2	M	H	H	S	H
CO3	H	S	S	M	S
CO4	H	M	H	S	H
CO5	H	S	H	S	H

S–Strong H –High M– Medium L–Low

Question Paper Pattern

Duration: 3 hrs **Max: 75 marks**

Section - A (10x1=10)
Choose the correct answer
Section - B (5x5=25)
Short answer questions, either or type, one question from each unit.
Section - C (5x8=40)
Essay answer questions, either or type, one question from each unit.

CIA EXAMINATION MARK BREAKUP

S. NO	DISTRIBUTION COMPONENT	MARKS
1.	CIA I – 75 Marks Converted to 30	**30**
2.	CIA II – 75 Marks Converted to 30	**30**
3.	Assignment I	**10**
4.	Assignment II	**10**
5.	Attendance	**05**
6.	Any Case Study related to Information Security	**15**
	Total	**100**

Programme Code: 25	**M.Sc. CLINICAL NUTRITION**			
Title of the paper: Non-Major Elective Paper **: Computer Applications in Nutrition**				
Batch 2024-2025	Hours/Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To learn the basics of computer and MS-WORD
2. To understand the concepts of MS-Excel and access
3. To acquire skills on the applications of computer in the field of clinical nutrition.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 To K5	CO1	To Understand basics of computer
	CO2	To Learn about the working of MS Office
	CO3	To Apply basic design principles for development and presentation
	CO4	To Gain skills for uploading patient's data
	CO5	To Utilize the software for patient assessment and interpret the output

Unit I **(12 Hours)**

Introduction to the world of computers Basic concepts on computer - history, types of computers, input and output devices, peripheral devices, meaning of software and hardware. MS Windows – Introduction, basic concepts on a windows, windows explorer, and control panel, configuration, editor. Accessories – Paint brush.

Unit II **(12 Hours)**

MS Word – concepts of document and template, creating documents and saving, concepts of editing, formatting,working with tables and tabs, tools, spell check, grammar check, file printing, mail merge, word art.

Unit III **(12 Hours)**

MS Excel – Concepts of spread sheet, creating, work sheet ,work space, formatting a work sheet, basic operations on data, sorting, total and subtotal, creating link between documents, programming in macros, working with charts, printing worksheets. MS PowerPoint – concepts of PowerPoint, creating, opening , saving presentations, working with different views, working with slides – make a new slide, move, copy, go to a specific slide, layout, adding and formatting text, adding clipart and other pictures, designing slide show, tools – meeting minds, presentationconference

Unit IV **(12 Hours)**

MS Access – Introduction to Access, working with databases, queries, tables, forms, reports, macros and charts.Internet – Basics of internet, basics of e mail, browsing.

Unit V **(12 Hours)**

Computer applications in nutrition, dietetics, nutritional assessment, menu planning and counseling

References

1. Introduction to computers – Balagurusamy (1995)
2. Internet –Complete reference – Hardley Hahn (1999)
3. PC software for office automation – T.Karthikeyan (2001)
4. Windows 98 – Microsoft Network (2000)
5. Ms Office - Microsoft Network (2000)
6. 6 Introductory Nutrition – H.Guthrie, S. Andrew (1988)
7. Normal and Therapeutic Nutrition- Corinne H. Robinson, Marilyn R. Lawler, Wanda L., Chenweth, Ann Garwin
8. Food Nutrition and Diet Therapy- Krause, M.V. Hunseher, M.A. (1980)
9. Understanding Normal and Clinical Nutrition – Whitney,E.N and Cataldo (1994)

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	S	M	L	H	M
CO2	S	M	M	S	S
CO3	S	M	H	S	H
CO4	S	M	H	S	H
CO5	S	M	M	H	L

S- Strong H-High M- Medium L- Low

Programme Code: 25	**M.Sc. Clinical Nutrition**			
Title of the paper: Non -Major Elective Paper: **Nutrition Counseling**				
Batch 2024 –2025	Hours /Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To understand the psychology of the patient
2. To develop diet counseling skills
3. To prepare the patients for food acceptability and create awareness among the communities about the importance of diet and good health

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K2	CO1	To Utilize the basic nutrition knowledge acquired to understand the various steps in nutrition care process.
	CO2	To Provide diet counseling to individuals, patients and groups.
	CO3	To Describe the various types of hospital diets and indications for use in clinical settings.
	CO4	To Apply principles of medical nutrition therapy for the dietary managements of lifestyle diseases namely CVD, Diabetes Mellitus and COPD
	CO5	To Explain nutrition care process to meet the nutritional needs for various ;diseases

Syllabus

Unit I **(12 hours)**

Role of a dietician - team approach to nutritional care, ethical code and responsibility.

Defining features of counselling psychology.

Unit II **(12 hours)**

Diet counseling skill: Tactics and techniques of counseling- evaluating and understanding the clients attitude, how to identify and express your feelings towards the client, utilizing proper counselling techniques- nonverbal behavior, verbal behavior, covert behavior.

Unit III **(12 hours)**

Concepts and principles in communication and their application in developing skills in counseling use of communication aids, communication and interviewing skills.

Unit IV **(12 hours)**

Health Psychology and behavior medicine- approach to prevention and treatment, Mind- body medicine. Therapeutic relationships: psychology of feeding the patients- Assessment of needs, education of the patient and follow up.

Unit V **(12 hours)**

Diagnosis and assessment - Eliciting clinical information- medical history, assessment of diet profile,counseling approaches after assessment, evauation of effectiveness.

References:

1. Gelso Charles,J. and Fretz Bruce, R. Counselling Psychology, a PRISM Indian edition Harcourt Brace College Publishers, 1995
2. Srilakshmi, B. Dietetics New Age International (P) Ltd, 1997

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO4	PSO 5
CO1	M	H	M	S	S
CO2	M	H	L	H	S
CO3	M	H	L	H	S
CO4	H	H	M	H	S
CO5	M	H	H	S	S

S- Strong H-High M- Medium L- Low

Programme Code: 25	M.Sc. Clinical Nutrition			
Title of the paper: Non-Major Elective Paper: **Nutrition in Environmental Health**				
Batch 2024 –2025	Hours /Week 4	Total Hours 60	Credits 4	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. Acquire knowledge on terminologies and learn about the different types of toxins
2. Modifying life styles based on environment and selection of safe nutritious food.
3. Interactions between toxins and nutrition

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 to K5	CO1	To Understand the terminology of toxins and their mechanism of actions
	CO2	To Know about the effect of toxins on nutrition.
	CO3	To Learn the type of toxins in drinking water and problems of water pollution.
	CO4	To Understand the microbial toxins and their mode of actions.
	CO5	To Analyze the impact of radioactive isotopes and drugs on the body.

Syllabus

Unit- I **(12 Hours)**

Definitions: environmental health, toxins & xenobiotics, Xenobiotics absorption, distribution & excretion. Food chain, food web & biomagnification.

Mechanisms & phases of Toxic action. Effects of toxin on nutrition. Definition of dose, dose effect and dose response. Synergism, antagonism and potentiation.

Mechanisms: mutagenesis, oncogenesis & teratogenesis.

Unit- II **(12 Hours)**

Natural toxins in foods: hemagglutinin, gossypol, lathyrogen, agents of favism, cyanogen, solanine.

Dietary toxin: -methanol, ethanol, argemone oil and tobacco (amblyopia) occurrence, etiology, pathology & treatment.

Food additives: – Toxicity and safe levels

Psycho active and Vaso-active substances: Phenyl propanes. Phenyl ethylamines, tropane. Alkaloids, tryamines, tryptamines, xanthine, sodium, ethylalcohol & monosodium glutamate.

Unit -III **(12 Hours)**

Aquatic toxicology: – Problems of water pollution; Origin, types and effects of pollutants on microorganisms, algae & fish. Microbial pollutants of ground water and health aspects of ground water pollution. Toxic effects of non-essential metals in food: –cadmium, mercury, lead and arsenic.

Unit- IV **(12 Hours)**

Microbial toxins: — Botulism, *Staphylococcus enterotoxicosis*, *Clostridium perfringens Bacillus cereus* & *Vibro parahaemolyticus*.

Fungal contaminants: aflatoxins, ergot alkaloids. Bongkrek toxins – sources, occurrence & toxicity.

Algal toxins: – occurrence, sources & toxicity.

Pesticides: insecticides, herbicides, fungicides, rodenticides & fumigants – role as contaminants, mode of action safe and level of use. **Mushroom toxicity**: – occurrence & toxicity.

Unit- V **(12 Hours)**

Radioactive nuclides – sources and biological effects.

Drugs: -Effects of drugs – abuses & characteristics – opiates, alcohol, marijuana, barbiturates, LSD & nicotine

Environmental contaminants – poly chlorinated biphenyls, poly brominated biphenyls, nitrates, nitrites & N-nitroso compounds - sources & toxic effects

References

1. PK Gupta: Modern Toxicology, Vol.I,.II & III, Metropolitan Book Co.
2. Invin Liener : Toxic Constituents of plant food stuffs, Academic Press NY
3. Turnes WB Alsidge: Fungal Metabolities. Vol. II., Academic Press NY
4. Ambalal shah : Drug Dilemmas. Adverse Reactions & interactions. MC. Millian Co., New Delhi.
5. Bowen HI.M : Trace Elements in Bio Chemistry – Academic Press NY
6. John NH Hathcock : Nutritional Toxicology Vol.I, Academic Press, NY
7. Shibamote. T Bjeldam. L.F. Introduction to food toxicology, Academic press, NY. 1999
8. Concon Jose M. Food toxicology. Principles and concepts, Marcel Dekker, NY. 1988.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	S	H
CO2	H	H	M	M	S
CO3	H	M	M	M	L
CO4	H	M	M	S	M
CO5	M	H	L	M	M

S- Strong **H-High** **M- Medium** **L- Low**

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Sub Code:24PCN3X1

Programme Code: 25	**M.Sc. Clinical Nutrition**			
Title of the Paper: EDC Paper: **Fundamentals of Nutrition**				
Batch 2024 –2025	Hours /Week 2	Total Hours 30	Credits 2	Employability/Skill Development/ Entrepreneurship

Course Objectives

1. To acquire knowledge on the major properties, functions and important food sources of the nutrients
2. To explain the significance of food practices in nutrition and disease prevention
3. To translate human nutrient needs into daily food selection utilizing appropriate guidelines and standards.

Course Outcomes (CO)

On Successful Completion of the Course, the Students will be able

K1 **to** K5	CO1	To Understand the importance of balanced diet for nutrient density and adequacy.
	CO2	To Gain knowledge on the functions of various nutrients.
	CO3	To Practice healthy eating habits for good health.
	CO4	To Provide culturally relevant and locally available food sources for various macro micro nutrients.
	CO5	To Gain skills and competence in meal planning and management.

Syllabus

Unit-I **(6 Hours)**

Introduction to nutrition - balanced diet, food groups – basic five, food pyramid, My Plate, the planning of balanced diet, food guides for selecting adequate nutrients.

Unit-II **(6 Hours)**

Macronutrients – Carbohydrates, Proteins, Fats – classification, food sources and functions, Proteins – Nutritional Classification, food sources, Essential amino acids and functions, Fats – food sources, Saturated and Unsaturated Fatty acids, Trans fats, Functions.

Unit III **(6 Hours)**

Micronutrients – Fat Soluble Vitamins – A, D, E, K – Basic functions, food sources. Water Soluble Vitamins – B complex & C – Basic functions, food sources.

Unit IV **(6 Hours)**

Minerals – Calcium, Iron, Zinc, Iodine, Selenium, Sodium, Potassium, Fluorine - Basic functions, food sources.

Unit V **(6 Hours)**

Meal planning for the family. Indian meal patterns - vegetarian & non-vegetarian. Menu planning for different age groups. Importance of adequate sleep and exercise for healthy living.

Teaching Methods

Chalk and Talk, Power point Presentations, Seminar, Quiz, Assignment, Smart Class Room

Sub Code:24PCN3X1

References

1. Briggs, G. M. &Doirs K. Collaway: Bogery Nutrition and Physical Fitness (9th Ed.) Saunders, Philadelphia.
2. Chaney, M. S. Rose M.L. &Wischi J. C. Nutrition, Houghton Mifflim, Boston.
3. Guthrie H.: Introductory Nutrition (6th Ed.) Times Mirror/Mostry College Publishing,
4. Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co.
5. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised _ Enlarged) BappCo.
6. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
7. Shills And Young. Modern Nutrition In Health And Disease.
8. International Life Sciences Institute Present Knowledge in Nutrition – latest edition

Mapping

PSO / CO	PSO1	PSO2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	H	S
CO2	S	S	L	S	S
CO3	S	S	H	M	S
CO4	M	S	S	S	M
CO5	M	M	L	S	H

S- Strong H-High M- Medium L- Low

Question Paper Pattern

Duration: 3 hrs **Max: 75 marks**

Section - A (10x1=10)
Choose the correct answer

Section - B (5x5=25)
Short answer questions, either or type, one question from each unit.

Section - C (5x8=40)
Essay answer questions, either or type, one question from each unit.

CIA EXAMINATION MARK BREAKUP

(For Theory Only)

S. NO	DISTRIBUTION COMPONENT	MARKS
1.	CIA I – 75 Marks Converted to 40	**40**
2.	CIA II – 75 Marks Converted to 40	**40**
3.	Assignment I	**05**
4.	Assignment II	**05**
5.	Attendance	**05**
6.	Others (Seminar, Group Discussion, Flipped Class room, etc.,)	**05**
	Total	**100**