PROGRAM OUTCOME (POs)	
Course Code	**M.Sc. CLINICAL NUTRITION**
PO1	**Advanced Knowledge and Understanding:** •Develop in-depth knowledge of clinical nutrition and dietetics, including the physiological, biochemical, and metabolic processes. •Understand the role of nutrition in disease prevention, management, and treatment, with a focus on medical nutrition therapy. •Stay informed the latest advancements in nutrition science and technology.
PO2	**Clinical Competency and Patient Care:** • Equip students with the skills to assess nutritional needs, create personalized nutrition plans, and monitor patient progress. • Gain proficiency in counseling patients and families about healthy eating, lifestyle modifications, and therapeutic diets. • Demonstrate the ability to apply nutritional science to clinical settings, including hospitals, rehabilitation centers, and community health organizations.
PO3	**Research and Evidence-Based Practice:** • Foster the ability to conduct independent research in clinical nutrition, contributing to new insights in the field. • Promote a scientific, evidence-based approach to nutrition interventions and patient care.
PO4	**Interdisciplinary Collaboration:** • Develop skills for working in collaborative healthcare teams, integrating the expertise of medical doctors, dietitians, and other healthcare professionals. • Communicate effectively with colleagues and patients from diverse backgrounds, ensuring inclusive and culturally competent care.
PO5	**Ethics and Professionalism:** • Instil high ethical standards in clinical practice, including patient confidentiality, informed consent, and professional integrity. • Embrace professional conduct and responsibility in all aspects of the clinical nutrition profession.
PO6	**Public Health and Nutrition Advocacy:** •Promote public health nutrition through education, advocacy, and community programs. •Understand and address public health challenges, such as malnutrition, obesity, and chronic diseases, through nutrition interventions. •Engage in nutrition policy-making and advocacy for better health outcomes on a population level.
PO 7	**Sustainability and Environmental Impact:** • Understand the importance of sustainable food systems and their impact on health and the environment.
PO8	**Lifelong Learning and Professional Development:** •Encourage continuous learning and professional growth through certifications, workshops, and seminars. •Stay updated with the latest trends and innovations in the nutrition field to adapt to evolving healthcare needs.
Course Outcomes (COs)	
Course Code	**M.Sc. CLINICAL NUTRITION**
SEMESTER I	
MCN 101 T	**Fundamentals of Nutrition**
CO1	Discuss the role of nutrients in human health and their contribution to preventing or managing certain disorders.
CO2	Describe the different forms of nutrients (carbohydrates, proteins, fats, vitamins, minerals, water, and electrolytes) and understand their procurement and requirements for the human body.
MCN 102 T	**Nutritional Biochemistry**
CO1	Outline the structure and function of the biomolecules found in all living organisms
CO2	Describe the circulatory system, cardiac cycle, and conditions like hypertension and heart failure.
CO3	Explain respiratory system functions, breathing mechanisms, and related abnormalities.
CO4	Comprehend renal system functions, urine formation, and dialysis principles.
CO5	Understand the structure and function of the nervous system, including the blood-brain barrier.
CO6	Analyze the digestive system, digestion, absorption, and gastrointestinal hormone functions.
CO7	Study musculoskeletal system functions, muscle contraction, and nerve impulse conduction.
CO8	Understand the endocrine system's glands, their regulation, and related disorders.
CO9	Interpret blood composition, blood cell formation, coagulation, and blood groups.

MCN 103 T	**Human Physiology**
CO1	Understand body systems: Gain knowledge of the structure and function of systems like circulatory, respiratory, renal, digestive, musculoskeletal, nervous, and endocrine systems.
CO2	Analyze physiological processes: Learn key processes such as membrane transport, cardiac cycle, respiration, urine formation, muscle contraction, and digestion.
CO3	Study special systems: Explore the functioning and disorders of the cardiovascular, respiratory, renal, and gastrointestinal systems, including blood pressure, ECG, and respiratory issues.
CO4	Comprehend endocrine and hematology: Understand the regulation and disorders of major glands (pituitary, thyroid, adrenal, pancreas) and blood functions like coagulation and anemia.
CO5	Integrate with clinical nutrition: Relate physiological knowledge to clinical nutrition, focusing on the connection between nutrition and health.
CO6	Enhance clinical application: Develop critical thinking skills to apply physiological knowledge in clinical nutrition practice and disease management.
CC 001 T	**Research Methodology & Biostatistics (Core Core)**
CO1	Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis interpretation & reporting of Results and use of statistical software.
MCN 106 CP	**MCN Directed Clinical Education - I**
CO1	Knowledge-Based competencies will build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.
CO2	Skill-Based competencies will emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.
CO3	Attitudinal competencies will focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.
SEMESTER II	
MCN 107 T	**Medical Nutrition Theraoy - I**
CO1	Conduct Comprehensive Nutrition Assessments: Use various clinical assessment tools (e.g., NRS, SGA, MNA) to assess patients' nutritional status, diagnose nutritional problems, and design appropriate interventions.
CO2	Provide Therapeutic Nutritional Support: Implement enteral and parenteral nutrition, manage related complications, and understand the impact of drug-nutrient interactions to deliver effective nutritional support for patients with therapeutic needs.
CO3	Manage Pediatric Nutrition: Develop and implement nutrition care plans for hospitalized infants and children, addressing conditions like low birth weight, failure to thrive, gastrointestinal issues, and congenital anomalies.
CO4	Manage Nutrition in Infectious Diseases: Address the nutritional needs of patients with febrile conditions and infections such as typhoid, malaria, tuberculosis, and HIV/AIDS, understanding the metabolic changes and dietary requirements during illness.
CO5	Address Energy Imbalance and Nutritional Disorders: Manage conditions such as obesity, underweight, and eating disorders by applying dietary, behavioral, and pharmacological strategies, with a focus on energy balance regulation.
CO6	Handle Immune System and Food Allergy Management: Design elimination diets and nutrition strategies for patients with food allergies, intolerances, and immune system disorders such as celiac disease and autoimmune conditions.
CO7	Manage Nutrition in Pulmonary and Musculoskeletal Disorders: Provide nutritional care for patients with pulmonary diseases (e.g., asthma, COPD) and musculoskeletal disorders (e.g., arthritis, osteoporosis), focusing on anti-inflammatory dietary approaches.
CO8	Implement Gastrointestinal Nutrition Therapy: Manage gastrointestinal disorders, including diseases of the upper and lower GI tract, malabsorption syndromes, and post-surgical care, improving clinical practice in digestive health.
CO9	Manage Endocrine Nutrition: Assess and provide nutrition interventions for patients with endocrine disorders like thyroid diseases, polycystic ovary syndrome (PCOS), Cushing's syndrome, and Addison's disease.
CO10	Understand and Manage Nutrient-Drug Interactions: Evaluate the clinical significance of nutrient-drug interactions and their effects on nutritional status, ensuring optimal treatment outcomes through appropriate management strategies.
MCN 108 T	**Community and Public Health Nutrition**
CO1	Define and understand key concepts in community and public health nutrition, including biomedical, ecological, psychological, and holistic approaches, as well as epidemiological methods such as case-control and cohort studies.
CO2	Assess nutritional status at individual and community levels using methods like anthropometry, biochemical, clinical, and dietary assessments.

CO3	Apply nutrition standards for growth monitoring in children and assess nutritional status in adults using WHO standards.
CO4	Understand and analyze food and nutrition security, including its dimensions and relevant policies in India, such as NFSA and the Public Distribution System.
CO5	Identify and address nutritional problems such as nutrient deficiencies, obesity, chronic diseases, and malnutrition, with an emphasis on integrated solutions and interventions.
CO6	Plan, execute, and evaluate nutrition education programs for communities, utilizing appropriate tools and overcoming implementation challenges.
CO7	Understand health and nutrition administration in India, including welfare programs, government policies, and the role of global health agencies like UNICEF and WHO.
MCN 109 T	**Food Microbiology**
CO1	Understand the basics of food microbiology, including microbial growth and factors affecting it.
CO2	Identify and describe microorganisms (molds, bacteria, yeasts, viruses) in food and their role in spoilage and foodborne diseases.
CO3	Recognize biochemical changes caused by microbes in food.
CO4	Analyze microbial contamination and spoilage in various food types.
CO5	Understand foodborne diseases, pathogens, and their detection methods.
CO6	Learn about microbial toxins and their health impacts.
CO7	Explore methods for controlling microorganisms in food, including preservation and novel processing technologies.
CO8	Understand food sanitation, including water quality, sewage treatment, and food safety standards like GMP and HACCP.
CO9	Apply microbiological criteria for food safety and understand the role of control agencies in ensuring food safety.
MCN 110 T	**Nutrition Through Lifecycle**
CO1	Understand nutritional requirements across the life cycle, from pregnancy to geriatrics.
CO2	Assess the impact of physiological and psychosocial changes on nutrition at each life stage.
CO3	Identify and manage nutrition-related challenges, such as high-risk pregnancies, childhood obesity, and aging-related issues.
CO4	Apply growth monitoring techniques and design dietary interventions for different age groups.
CO5	Address specific nutritional issues like breastfeeding, weaning, and adolescent eating disorders.
CO6	Develop nutrition plans for preventing and managing health problems, including chronic diseases in the elderly.
MCN 113 CP	**MCN Directed Clinical Education - II**
CO1	Knowledge-Based competencies will build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.
CO2	Skill-Based competencies will emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.
CO3	Attitudinal competencies will focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills-key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.
Discipline Specific Elective	
DSE 001 T	**Nutrigenomics**
CO1	Understand Molecular Biology: Grasp gene structure, DNA processes (replication, transcription, translation), RNA functions, and gene regulation mechanisms.
CO2	Learn Tools and Techniques: Apply molecular techniques like PCR, sequencing, microarrays, and data mining for genetic research.
CO3	Explore Foods and Genes: Understand how nutrients regulate gene expression and influence health, including the genetic impact of bioactive foods, vitamins, minerals, and antioxidants.
CO4	Identify Health Biomarkers: Study genetic markers for disease prediction, metabolic dysfunction, and inflammation, using case studies like IGF rs680 polymorphisms.
CO5	Apply Gene Approaches to Diseases: Investigate gene-nutrient interactions in conditions like obesity, cardiovascular diseases, and cancer, and understand their role in disease prevention and treatment.
CO6	Engage in Personalized Medicine: Learn how genetic counseling, clinical trials, and personalized nutrition can promote health and wellness.
DSE 002 T	**Nutraceuticals and Drug Interaction**
CO1	Understand Nutraceuticals: Learn definitions, classifications, approval processes, and pharmacokinetics of nutraceuticals.
CO2	Analyze Bioactive Components: Study the health benefits and effects of components like polyphenols, phytosterols, and prebiotics in functional foods.
CO3	Explore Drug-Nutrient Interactions: Understand mechanisms and effects of drug-nutrient interactions.
CO4	Impact of Pharmaceuticals on Nutrition: Assess how drugs like antihypertensives, antiepileptics, and hormones influence nutritional status.
CO5	Drug-Nutrient Interactions in Health Conditions: Examine interactions in cancer, infections, transplants, and immune function.
CO6	Special Nutrition Support: Understand interactions in enteral and parenteral nutrition, and the role of probiotics and functional foods.