

Approved Curriculum

MS Human Nutrition

Table of Contents

1	Introduction	4
2	Our vision.....	4
3	Our Mission.....	4
4	Core Values	4
5	Scope	4
6	MPhil Program in Human Nutrition.....	5
6.1	Program structure	6
7	MPhil Human Nutrition Courses.....	6
7.1	COMP: Biostatistics /Research Methods	8
7.1.1	Course objectives.....	8
7.1.2	Course contents	8
7.1.3	Recommended readings (Text books)	8
7.1.4	Journals, periodicals and web sources.....	Error! Bookmark not defined.
7.2	HUN: Maternal, Infant, Child and Adolescence Nutrition (MICAN).....	9
7.2.1	Course objectives.....	9
7.2.2	Course contents	9
7.2.3	Further reading (Books)	10
7.2.4	Journals & Web Resources.....	10
7.3	HUN: Nutrition Counseling & Communication Skills.....	10
7.3.1	Course objectives.....	10
7.3.2	Course contents	10
7.3.3	Further readings (Books).....	11
7.3.4	Journals.....	11
7.4	HUN: Clinical Nutrition-1.....	11
7.4.1	Course objectives.....	11
7.4.2	Course contents	11
7.4.3	Recommended readings (Text books)	14
7.4.4	Journals, periodicals and web sources.....	14
7.5	HUN: Fundamentals of Human Nutrition	Error! Bookmark not defined.
7.5.1	Course objectives.....	Error! Bookmark not defined.
7.5.2	Course contents	Error! Bookmark not defined.
7.5.3	Further readings (Books).....	Error! Bookmark not defined.
7.5.4	Journals.....	Error! Bookmark not defined.
7.6	COMP: Biostatistics /Research Methods	14
7.6.1	Objectives.....	14
7.6.2	Course contents	14
7.6.3	Further book reading	14
7.6.4	Journals, Periodicals, Websites	Error! Bookmark not defined.
7.7	HUN: Public Health Nutrition.....	15
7.7.1	Course objectives.....	15
7.7.2	Course contents	15
7.7.3	Recommended readings (Text books)	16

7.7.4	Journals, periodicals and web sources.....	16
7.8	HUN: Clinical Nutrition-II	17
7.8.1	Course objectives.....	17
7.8.2	Course contents	17
7.8.3	Further readings (Books).....	18
7.8.4	Journals & Websites.....	18
7.9	HUN 752: Food Safety.....	19
7.9.1	Course objectives.....	19
7.9.2	Course contents	19
7.9.3	Recommended readings (Text books).....	20
7.9.4	Journals, periodicals, and web sources.....	20
7.10	HUN 753: Advance Nutritional Epidemiology.....	20
7.10.1	Course objectives.....	21
7.10.2	Course contents	21
7.10.3	Recommended readings (Textbooks).....	21
7.10.4	Journals, periodicals and web sources.....	21

1 Introduction

Nutrition plays a central role in human health and wellbeing throughout the life. When people have access to adequate food in reasonable amount, it leads to optimal nutritional status and good health. This fact has been known to humans since ancient times. However, the science of human nutrition and its public health applications have dramatically evolved over the past three decades. Thanks to the recent advances in the field of molecular biology and genetics, our understanding of the role of diet and nutrition in protection against diseases and improving quality of life has significantly increased. Nutritional science is now a field of growing importance in many aspects of healthcare, life style, industry and policy development. Improved nutritional status is also key to achieve Sustainable Development Goals (SDG's) as it directly contributes to productivity, poverty reduction and economic development by improving physical and psychological health; thus laying the foundation of stable, secure and peaceful societies.

2 Our vision

Provision of the best possible quality higher education to females with primary focus on the development of well-trained and skilled human resource in Human Nutrition through high class teaching and research.

3 Our Mission

Developing and delivering academic services to female students, public-private sectors through continuous improvement in Faculty development, laboratory and class room facilities and building partnership with institution, non-governmental organizations and industries.

The Mission of the M.phil Human Nutrition program is to better human health by:

- contributing to the fundamental knowledge of how nutrients and food components function at cellular, systematic, and whole body levels and impact human health and disease,
- delivering innovative, research-based interventions and service programs which alter meal patterns and food choices with the goal of improved health of individuals, families, and communities,
- contributing to the knowledge-base of nutrition graduate female students through high quality teaching, training, and research mentorship,
- Providing service to professional, governmental, and local community organizations.

4 Core Values

- Knowledge and discovery
- Innovation
- Responsibility
- Professionalism
- Inclusiveness

5 Scope

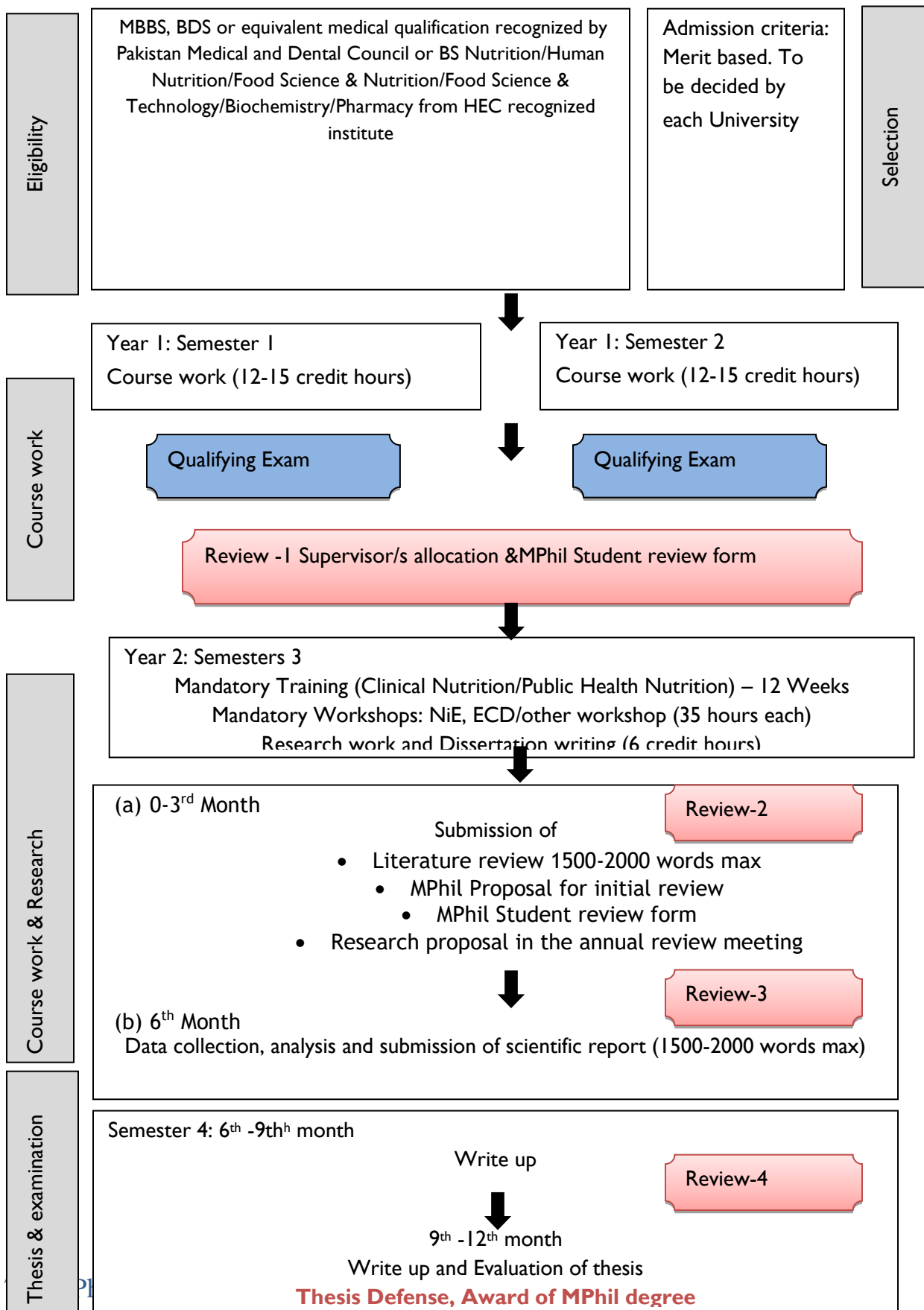
Human Nutrition programs is a unique combination of nutrition education and research activities to prepare them for a wide variety of career opportunities. The course contents are flexible and the students are free to choose different fields of specialization depending on their choice, orientation and future employment. The future outlook for employment in nutrition is promising since more and more people are realizing the role of nutrition in health. With post-graduation in nutrition, the students can work in the scope of this program in terms of market, social and employment perspective

- Research and academic organizations (both public sector and private)
- Health sector such as hospitals/Public Health Nutrition.
- Private practice as nutritionist
- Industries such as food and healthcare industries.
- In different programs of Non-Government Organizations (NGOs) and international agencies like iNGOs, WHO, WFP, FAO, UNICEF, DFID, AUSAID, World Bank etc.
- Sports nutrition

6 Objective of MPhil Program in Human Nutrition

MPhil Human Nutrition program is the most appropriate qualification for future nutrition professionals. Major objective of M.Phil program is to produce competent graduates both educationally sound and directly relevant to future needs of the country in the field of nutritional sciences. The overall objective is to produce quality nutrition professionals with vision, knowledge, and creativity and leadership skills to improve the quality of nutritional care in the region and country as a whole.

6.1 Program structure



First Semester (spring 12-15 credit hours)

COMPULSORY COURSES

1. COMP: Biostatistics 03 (02+1) Credit Hrs

SPECIALITY COURSES

2. HUN: MICAN (Maternal, Infant, Child and Adolescence Nutrition) 03 (2+1)/3+0 Credit Hrs
3. HUN: Nutrition counseling & communication skills 03 (2+1)/02 Credit Hrs
4. HUN: Clinical Nutrition-I 03 (2+1) Credit Hrs

DEFICIENCY/OPTIONAL COURSES (ANY OF THE BELOW OPTIONAL)

5. DEFICIENCY: Fundamentals of Human Nutrition 2+0/3+0/2+1 Credit Hrs

Second Semester (FALL 12-15 Credit Hours)

COMPULSORY COURSES

1. COMP: Research Methods 03 Credit Hrs

SPECIALITY COURSES

2. HUN: Public Health Nutrition 03 (2+1) Credit Hrs
3. HUN: Clinical Nutrition-II 03 (2+1) Credit Hrs
4. HUN: Nutritional epidemiology 03 (2+1) Credit Hrs

OPTIONAL COURSES (At least one)

- i. Exercise & Sports Nutrition 03 (2+1)/3+0 Credit Hrs
ii. Nutrition Project Management 03 (2+1)/3+0 Credit Hrs
iii. Personalized Nutrition 03 (2+1)/3+0 Credit Hrs
iv. Food services management 03 (2+1)/3+0 Credit Hrs
v. Nutrition Aging 03(2+1)/3+0 Credit Hrs
vi. Nutritional Biochemistry 03 (2+1)/3+0 Credit Hrs
vii. Nutritional Immunology 03 (2+1)/3+0 Credit Hrs
viii. Sustainable Food System 03 (2+1)/3+0 Credit Hrs
ix. Food Quality Assurance Management 03 (2+1)/3+0 Credit Hrs
x. Early Childhood Development 03 (2+1)/3+0 Credit Hrs

Third & Fourth Semester (Credits 6)

1. Twelve-week mandatory internship (training + research): Clinical or Public Health Nutrition
2. Workshops (Mandatory, non-credit): i) Nutrition in Emergencies ii) Early Childhood Development (if already taken as course/ other optional workshop)
3. Synopsis & Research

7.1 COMP: Biostatistics

(2+1 Credit Hrs)

7.1.1 Course objectives

- M.phil scholar will be able to understand application of biostatistics in Human Nutrition research
- M.phil scholar will be able to differentiate different types of data and its handling
- M.phil scholar will be able to have practice handling on use of statistical analysis for different data sets,

7.1.2 Course contents

Bio Statistics

Definition and importance of Statistics in Human Nutrition, Data Different types of data and variables Classification and Tabulation of data, Frequency distribution, stem-and-Leaf diagram, Graphical representation of data Histogram, frequency polygon, frequency curve.

Measure of Central tendency, Definition and calculation of Arithmetic mean, Geometric mean, Harmonic mean, Median quantiles and Mode in grouped and un-grouped data.

Measure of Dispersion, Definition and Calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation. Sampling Probability and non-Probability Sampling, Simple random sampling stratified random sampling Systematic sampling error, Sampling distribution of mean and difference between two means. Interference Theory: Estimation and testing of hypothesis, Type—I and type-II error, Testing of hypothesis about mean and difference between two means using Z-test and t-test, Paired t-test, Test of association of attributes using X² (chi-square) Testing hypothesis about variance.

Practical:

- a. Frequency Distribution
- b. Stem-and-Leaf diagram
- c. Various types of Graphs
- d. Mean, Geometric mean Harmonic Mean,
- e. Median, Quartiles Deviation, mean Deviation.
- f. Standard Deviation, Variance, Coefficient of variation,
- g. Skewness and kenosis
- h. Sampling random sampling
- i. Stratified random sampling.
- j. Sampling distribution of mean
- k. Testing of hypotheses regarding population mean
- l. Testing of hypotheses about the difference between population means
- m. Chi-square test
- n. Testing of Correlation Coefficient
- o. Fitting of simple linear regression
- p. One-way ANOVA
- q. Two-way ANOVA

7.1.3 Recommended readings (Text books)

1. Introduction to Statistical Theory Part- I by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)
2. Statistical Methods and Data Analysis by Dr. Faquir Muhammad
3. A. Concise Course in A. Level Statistic with world examples by J. Crashaw and J. Chambers (1994)
4. Basic Statistics an Inferential Approach 2nd ed. (1986) Fran II. Dietrich-II and Thomas J. Keans
5. Introduction to Statistical Theory Part-II by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)
6. Statistical Methods and Data Analysis by Dr. Faquir Muhammad
7. Principles and Procedures of Statistics A Bio-material approach, 2nd ed., 1980 by R. G. D Steal and James H. Tarric
8. Statistical Procedures for Agricultural Research 2nd ed.,(1980) by K. A. Gomez and A. A. Gomez

7.2 [HUN: Advance Nutrition across life stages](#)

(2+1 Credit Hrs)

This course will provide the student with the updated knowledge, skills and competencies required to understand and manage the physiological needs of nutrients and dietary challenges during pregnancy, lactation, infancy, and childhood until adolescence. The nine months of pregnancy represent the most significant stage of growth and development in humans. Nutrition is one of the modifiable factors which impacts how well the growth and development processes occur during pregnancy. In the first module, students will learn about the role of nutrition in fostering fetal growth, development, and long-term health. This section will also discuss weight-gain recommendations and consider common problems during pregnancy that can be managed with nutritional remedies. The second module will cover the period of infancy. Rapid growth during the first year of life is the hallmark of infancy when compared to all other ages. Growth occurs most rapidly from birth to 6 months of age than at any other period in the life cycle. This section will discuss how nutrition is an essential component in the complex development of infants. The third module will focus on growth and development in children and adolescents and their relationships to nutritional status. Students will learn how to manage various nutritional challenges seen in children and adolescents. This course is relevant to nutrition and other healthcare professionals who manage pregnant women and children.

7.2.1 **Course objectives**

Upon successful completion of this course, the students will be able to:

- Understand nutrition role in the first one thousand golden days of the life i.e. fetal growth & development, and infancy
- Learn about antenatal and post-natal care, child health needs including vaccination.
- Understand nutrition role in the growth and development during toddler, childhood and adolescence.
- Assess nutritional status during pregnancy, infancy, childhood and adolescence using WHO growth charts
- Identify infants with feeding difficulties and failure to thrive
- Manage various nutritional challenges seen in children and adolescents, especially eating disorders during adolescents.

7.2.2 **Course contents**

Module – 1: Nutrition in Pregnancy & Lactation

Contents: Nutrition during pregnancy: Pregnancy and weight gain; critical periods of pregnancy in terms of nutrition; Requirements of nutrients and fetal growth; Nutritional problems during pregnancy; ante-natal and post-natal care, Supplementation & intervention. Nutritional assessment during pregnancy; Physiology of lactation; maternal nutritional requirements during breastfeeding; appropriate breastfeeding process, duration and impact on mother's physiology

Module – 2: Infant Nutrition

Contents: growth and development during infancy; growth process in the toddler and preschoolers; nutritional requirements during infancy, common feeding complications during infancy, infant health needs including vaccination

Module - 3: Child & Adolescent Nutrition

Contents: Toddlers and preschoolers; complementary feeding; common feeding complications toddlers age; growth and development during childhood; physical growth, weight and height, physiological development in relation to nutrition, hematological development psychosocial and biological interaction, nutrient requirements and RDA-energy, protein, minerals, vitamins with special emphasis an calcium, iron, vitamin A, D, E, K and C; Problems and Nutritional Care of Children; childhood illnesses and its prevention, basic vaccination; Physiology of adolescence; physical growth, sex differences, hormonal influences on growth and maturation; changes in body composition that are associated with the pubertal phase of growth; Nutrient requirements during different stages of adolescence (Energy and macronutrients, micronutrients); Nutritional problems of adolescents (Obesity, anorexia nervosa, iron deficiency anemia, iodine deficiency disorder, ACNE vulgaris, oral contraceptive, pregnancy); Food choices and preferences and factors influencing them during adolescence; Adolescents lifestyle related to nutrition (athletes or sports; vegetarians); Nutritional assessment of adolescents (tools and standards)

Practical (Community & Hospital based)

Practical – I: Maternal nutritional status assessment of pregnant mothers (in Maternity care) to identify dietary problems and acute malnutrition

Practical – II: Identification of breastfeeding difficulties (positioning, attachment and related skills for successful lactation)

Practical – III: Assessment of children nutritional status using WHO growth softwares (WAZ, WHZ and HAZ)

Practical – IV: Cases Studies – pregnancy related complications

Practical – V: Cases Studies – successful breastfeeding initiation and continuation

Practical – VI: Cases Studies – Complimentary feeding preparation and consumption

Practical – VII: Case Studies – Related to adolescence eating disorders.

7.2.3 Further reading (Books)

- Sharlin, J. and Edelstein, S., 2010. Essentials of life cycle nutrition. Jones & Bartlett Publishers.
- Brown, J.E., 2020. Nutrition through the life cycle. Cengage Learning.
- Bernstein, M. and McMahon, K., 2022. Nutrition Across Life Stages. Jones & Bartlett Learning.
- Infant and Young Child feeding strategy: Pakistan. Ministry of Health

7.2.4 Journals & Web Resources

- American Journal of Clinical Nutrition
- Journal of Nutrition
- Lancet
- Lancet: Global Health
- Nutrients
- European Journal of Clinical Nutrition

7.3 HUN: Nutrition Counseling & Communication Skills

(2+1 Credit Hrs)

This Course aimed to increase the effectiveness of Nutrition/Health Care Professionals as facilitator of behavioral change in the nutritional management. The term “nutrition counselor” refers to registered dietitians/nutritionist and will involve other health professionals-medical doctors, nurses, psychologists, or behavioral therapists-who interact with nutritionist/dietitians. Nutrition counseling can be personalized or delivered in groups settings; it is on the preventive than therapeutic approach, and there is transmission of knowledge. The goal of nutrition education and nutrition counseling is to help individuals make meaningful changes in their dietary behaviors.

7.3.1 Course objectives

Upon successful completion of this course, the students will be able to:

- Demonstrate effective use of tools for nutrition counseling and communication skills in the nutrition care process. Develop and articulate standard nutrition information, education and communication material in written, orally, or through electronic, print or social media outlets for diverse audiences.
- Select and apply appropriate strategies when presented with dietary problems.
- Evaluate and monitor progress, achievements, and failures in both clients and themselves.
- Adapt counseling strategies based on client and self-evaluations (client’s education, language, age group and problem presented).
- Communicate (evaluate) the scientific evidence behind food messages, popular diets, and common nutrition misconceptions.

7.3.2 Course contents

Chapter – I: What is Nutrition Counseling; Counseling Skills, Counseling techniques (One- One to one, focus groups discussion, lecture/class room method); Behavior change communication theories, skills that support Behavior Change – Problem-solving and Goal-setting, Health Belief Model, Social Cognitive Theory;

Chapter – II: Skills and Attribution of the Nutrition educator or counselor / 5 As (Ask, Assessed, Attitude); Effective Interviewing Skill; Developing and delivering effective oral, written, and visual communications; Applications of interviewing and counseling skills; Nutrition counseling for healthy life-style; The Interview Process, Mock Interviews;

Chapter – III: Nutrition Care Process and Proper Documentation; Report Writing / Presentation; Assessments /Documentaries/ Case Studies / successes Stories; KAP Approaches / tools Development; Personalized Counseling/ Motivational Interviewing, Principles of Motivational Interviewing & Adult Learning; Demonstrating knowledge of the principles of program planning and apply them to develop a community nutrition program; Verbal /Non- Verbal Communication; Motivational Interviewing Practice; Stages and

Chapter – IV: Processes of Health Behavior Change; Counseling for Behavior Modification; Advocacy and Social Mobilization; Community Sensitization / Mobilization; Nutrition and Social Rehabilitation; Counseling for Cognitive Change; Communicating through interpreters; Using Open-ended Questions, Affirmations, Reflective Listening, and Summaries; Opening a Session, Information Sharing, and Giving Advice; Group Counseling and Education: Planning Learning; Group Counseling and Education: Age-Appropriate Teaching;

Chapter – V: Questionnaire Development/ Questionnaire Based Interviews; Dietary Intake, The basics of communication and counseling skills for nutrition, application of interviewing and counseling skills, ending counseling sessions, counseling skills to facilitate self-management, nutrition counseling in treatment of obesity, nutrition counseling in prevention and treatment of coronary heart disease, nutrition counseling in treatment of diabetes, nutrition counseling in treatment of renal disease, nutrition counseling in treatment of hypertension, nutrition counseling for cancer risk prevention.

Practicals?

7.3.3 Further readings (Books)

- Contento IR. Nutrition Education: Linking Research, Theory and Practice. 4th Edition. Jones and Bartlett, 2020.
- Adler RB, Rodman G, Sévigny, A. Understanding Human Communication Second Canadian Ed. Don Mills, ON: Oxford University Press; 2011.
- Krause' food and the nutrition care process, 14th edition. Authors: L.Kathelin Mahan, Janice L. RaymondKaren Chapman-Novakofski, PhD, RDN, LDN
- Nutrition counselling for nutrition care process, 4 th edition. Authors: Linda G. Snetselaar, RD, PhD, LD.

7.3.4 Journals

- American Journal of Clinical Nutrition
- European Journal of Clinical Nutrition
- Asia pacific Journal of Clinical Nutrition

7.4 HUN: Advance Dietetics -1

(2 + 1 Credit Hrs)

Studies clinical nutrition as it relates to the prevention and treatment of disease. The course deals with the nutritional aspects of diseases and clinical disorders by integrating students' existing knowledge of physiology and biochemistry and food science.

7.4.1 Course objectives

Upon successful completion of this course, student will be able to

- Demonstrate knowledge of nutrition principles and their application to disease prevention and management.
- Interpret and translate scientific knowledge and principles related to nutrition into practical information.
- Demonstrate a knowledge of medical terminology and medical abbreviations associated with nutrition related diseases and conditions.
- Collect, organise and assess data relating to the health and nutritional status of individuals.

7.4.2 Course contents

Chapter – I Introduction

Introduction to clinical nutrition, Role of clinical nutritionist, job specialization, NCP- Nutritional assessment, nutritional diagnosis, nutritional intervention, nutritional monitoring and evaluation, Routine Hospital Diet- Clear fluid, full fluid, soft and normal diet. Enteral and Parenteral support

Chapter – II Obesity and Nutritional Care

Regulation of body weight, Genetics and body weight, body weight assessment
Obesity: Etiology, Assessment, Classification, Management of Obesity - Medical, Nutritional, Lifestyle management, Role of exercise, Surgical complications, Childhood Obesity.

Underweight: Etiology Metabolic consequences of starvation and Management.

Chapter – III Eating Disorders and Nutritional Care

Nutritional Aspects of Eating Disorders and Nutritional management of eating disorders: Anorexia Nervosa, Bulimia Nervosa, Binge eating disorders, Anorexia athletic, Body dysmorphic disorder, Muscle dysmorphic disorder (bigorexia), Orthorexia nervosa, Pregorexia, Drunkorexia, Infection-triggered, auto immune subtype of anorexia nervosa in young children, Night-eating syndrome, Rumination syndrome, Gourmand syndrome, Prader-Willi syndrome, Pica, Cyclic vomiting syndrome, Chewing and spitting

Chapter – IV Diabetes Mellitus and Nutritional Care

Aetiology, classification, pathophysiology symptoms and diagnosis - i) Blood glucose monitoring-GTT, FBS, PPBS, RBS ii) Glycosylated hemoglobin iii) Urine testing Management of DM, Blood sugar lowering agents- Oral hypoglycemic agents, Insulin therapy, Nutritional management- Diet planning for Type1, Type2, For Special conditions– Pregnancy, Elderly and Surgery. Acute complications – pathophysiology, diagnosis, types, treatment - Hypoglycemia, Hyperglycemia, Ketoacidosis, Somogyi effect and Dawn phenomenon. Chronic complication - pathophysiology, diagnosis, types, and treatment – Atherosclerosis, Nephropathy, Neuropathy, Retinopathy and infections

Chapter – V Cardiovascular Diseases and Nutritional Care

Blood pressure - Regulation, Short-term (sympathetic nervous system) and long-term (kidneys) Hypertension – classification (secondary and essential) Risk Factors for hypertension, Dietary management-DASH approach. Hyperlipidemia and Hyperlipoproteinemia- Classifications, dietary management. Atherosclerosis – Etiology and understanding the pathogenesis. Coronary Heart Disease - Angina Pectoris and Myocardial Infarction - Clinical manifestation and importance of cardiac enzymes to aid in the detection of CHD - Dietary Management Congestive Heart Failure - Pathogenesis - Pathogenesis of sodium and water retention Risk factors, Clinical manifestation Cardiac Cachexia Treatment - Nutritional Care Cerebrovascular Disease and Peripheral Vascular Disease-Inbriefetiologyanddietarycare.RheumaticandCongenitalHeartDisease-Clinical manifestation, pathogenesis and nutritional care

Chapter – VI Nutritional Anemias and Nutritional Care

Erythropoiesis and haemoglobin synthesis, Nutrients involved in Erythropoiesis Classifications, symptoms of Anemias and Nutritional Care. Normocytic anemia– aplastic anemia, Megaloblastic anemia, Microcytic anemia Sickle cell anemia and Thalassemia, Hemolytic anemia

Chapter - VII Disease of Musculoskeletal System and Nutritional Care

Arthritis, osteoarthritis, osteoporosis, Gout, Dental Caries

Chapter - VIII Cancer and Nutritional Care

History of cancer, development of cancer, characteristics and identification of cancers. Carcinogens in foods, Etiology and Pathogenesis of carcinogenesis. Metabolic and Nutritional Alterations in Malignancy. Types of therapy and their side effects. Nutritional impacts of cancer therapy. Bone Marrow Transplant and its nutritional care. Nutritional requirement of the Cancer patient

Practical

Practical – I Preparation of energy restricted diet

Practical – II Diet prescription and preparation for diabetic patients

- Practical – III** Diet prescription and preparation for atherosclerotic patients
- Practical – IV** Diet prescription and preparation for hypertensive patients
- Practical – V** Diet prescription and preparation for anemic patients
- Practical – VI** Diet prescription and preparation for osteoporosis and Dental caries
- Practical – VII** Diet prescription and preparation for cancer patients

7.4.3 Recommended readings (Text books)

- Raymond, Janice L., and Kelly Morrow. Krause and Mahan's Food and the Nutrition Care Process. Elsevier Health Sciences, 2020. 15th .Edition.
- Nelms, Marcia, and Kathryn P. Sucher. "Nutrition Therapy and Pathophysiology." (2019). 4th Edition.
- Rolfes, Sharon Rady, Kathryn Pinna, and Ellie Whitney. Understanding Normal and Clinical Nutrition. Cengage learning, 2014. 12th Edition

7.4.4 Journals, periodicals and web sources

- International Journal of Epidemiology
- American Journal of Clinical Nutrition
- British Journal of Nutrition
- Public Health Nutrition
- Websites of International Cancer Research Fund, World Bank
-

7.5 COMP: Research Methods (03) Credit Hrs)

7.5.1 Objectives

- To apply tools and skills required to understand published research
- To identify the types of methods best suited for investigating different types of problems and questions
- To get hands-on training of writing successful research proposals for thesis and projects
- To take ethical considerations in research and publications

7.5.2 Course contents

Research methods in nutrition: Introduction, objectives, types of research: basic and applied, quantitative and qualitative, clinical and diagnostic; Types of sampling: probability and non-probability; Collection of literature: printed and electronic sources, managing literature; Methods of data collection; Writing scientific documents: synopsis, research proposal, articles, references, internship report. Research designs: observational studies, cross-sectional, case-control, cohort (prospective, retrospective, time-series); Experimental studies: observational studies, clinical studies. Experimental data analysis: incidence/prevalence rate; Research ethics.

7.6.3 Recommended readings (Text books)

1. Awan, J.A. 2015. Scientific Presentations. Unitech Communications, Faisalabad, Pakistan.
2. Lovegrove, J.A., L. Hodson, S. Sharma and S.A. Lanham-New. 2015. Nutrition Research Methodologies. Wiley-Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.
3. Lowe, M. 2007. Beginning Research: A Guide for Foundation Degree Students, 1st ed. Routledge Publications, New York, USA.
4. Starks, T.P. 2006. Trends in Nutrition Research. Nova Science Publishers, Inc.,

New York, USA.

5. Walliman, N. 2005. *Your Research Project, A Step by Step Guide for The First-time Researcher*, 2nd ed. Sage Publications, Thousand Oaks, CA, USA.

7.6 HUN: Public Health Nutrition

(2 + 1 Credit Hrs)

Public health nutrition involves the promotion of health through nutrition and the prevention of nutrition related disease in a population. The course will focus on improving the food choices, dietary intake, and nutritional status at the community, regional, or national level. It involves enabling students to assess nutritional problems and needs by considering environmental causes, identifying intervention points, developing policies and programs to intervene at those points, implementing the policies or programs, and evaluating the effectiveness of the intervention.

7.6.1 Course objectives

Upon successful completion of this course, student will be able to

- Define the theory and practice of public health nutrition
- Describe methods for evaluating community nutrition status and identify current community nutrition problems
- Characterize populations at the greatest risk for malnutrition and nutrition related disease, including principal biological, cultural, socioeconomic, and nutritional determinants of diet-related disease risks
- Identify methodologies for nutrition intervention from an individual, community, program and policy level including similarities and differences
- Identify educational resources and public nutrition services available in the US, identifying which programs target food insecurity, hunger, nutritional deficiencies, over nutrition and diet-related chronic disease.
- Describe the strengths and weaknesses of current nutrition services and resources
- Develop audience specific nutrition education messages.

7.6.2 Course contents

Chapter # 1 Concept and Principles of Public Health Nutrition

Public Health Nutrition and its scope, Components of Public Health Nutrition, Role of Health professionals and agencies in uplifting public health nutrition, Nutrition and Disease consequences of unbalanced diet, changing patterns of diet and disease across the globe, Theories of Public health nutrition; Role of macro and micronutrients in maintaining health and its consequences, Critical understanding of the scientific basis of nutritional requirements, factors that influence these requirements, application to populations throughout lifecycle.

Chapter # 2 Global challenges for Food Security

Overview of Food Security and its four pillars, Measurement of food security Challenges to sustainable, safe, and equitable food supplies, Different conceptual frameworks, such as food security and food regimes, Contributions of different academic disciplines in developing multi-sectoral actions for address Food security. Food security assessment tools, the role of the UN, government, and private sector actors in relation to food production, trade, access and consumption, Current policies to establish safe and equitable food supplies, Factors such as the impact of climate change on food supplies.

Chapter # 3 Burden of Malnutrition and Nutrition Interventions

National and international surveys, Global burden of disease specific to nutrition i.e., under-Nutrition, over-nutrition, micronutrients deficiencies, Evidence-based approaches (Nutrition sensitive and specific) to the prevention, management, and control of nutritional disorders of public health nutrition problems, Health Education in Nutrition: Nutrition Counselling, Nutritional and social rehabilitation.

Chapter # 4 Policy and Governance for Public Health Nutrition

Political influences on health and nutrition policies and governance. Exploring policy making and governance frameworks, Policy analysis for their assessment.

Chapter # 5 Non-Communicable Disease

Non-communicable diseases disorders i.e. HIV/AIDS, Diabetes, Hypertension etc it burden, Causes and its preventions. Nutrition in special circumstances i.e. Disasters (Natural and manmade).

7.6.3 Recommended readings (Text books)

- Roger Hughes; Barrie M Margetts. 2011. Practical public health nutrition. Wiley-Blackwell. 9781444329216, 1444329219, 9781283869065, 1283869063
- Public Health Nutrition. Rural, Urban, and Global Community-Based Practice: Editors: Margaret Barth, PhD, MPH, Ronny Bell, PhD, Karen Grimmer, PhD. Springer publishing.
- Arlene Spark.2004. Nutrition in Public Health: Principles, Policies, and Practice. ISSN: 0849314739, 9780849314735, 9780203507889
- PUBLIC HEALTH NUTRITION 2 nd ed. BUTTRISS, WELCH, KEARNEY ISBN: 978118660973 <https://books.google.com/books?id=lb6nDgAAQBAJ&dq=public+health+nutrition+welch>.

7.6.4 Journals, periodicals and web sources

- The World Bank, IMF websites.
- Journal of Development Economics
- Journal of Development Studies
- Food Policy
- Development Policy Review

7.7 HUN: Advanced Dietetics -II

(2+1 Credit Hrs)

Studies clinical nutrition as it relates to the prevention and treatment of disease. The course deals with the nutritional aspects of diseases and clinical disorders by integrating students' existing knowledge of physiology and biochemistry and food science.

7.7.1 Course objectives

Students completing this course will be able to

- Demonstrate knowledge of nutrition principles and their application to disease prevention and management.
- Interpret and translate scientific knowledge and principles related to nutrition into practical information.
- Demonstrate a knowledge of medical terminology and medical abbreviations associated with nutrition related diseases and conditions.
- Collect, organise and assess data relating to the health and nutritional status of individuals.

7.7.2 Course contents

Chapter 1. Introduction

Introduction to clinical nutrition, Role of clinical nutritionist, job specialization, NCP- Nutritional assessment, nutritional diagnosis, nutritional intervention, nutritional monitoring and evaluation, Routine Hospital Diet- Clear fluid, full fluid, soft and normal diet. Enteral and Parenteral support.

Chapter 2. Obesity and Nutritional Care

Regulation of body weight, Genetics and body weight, body weight assessment Obesity: Etiology, Assessment, Classification, Management of Obesity - Medical, Nutritional, Lifestyle management, Role of exercise, Surgical complications, Childhood Obesity. Underweight: Etiology Metabolic consequences of starvation and Management.

Chapter3. Eating Disorders and Nutritional Care

Nutritional Aspects of Eating Disorders and Nutritional management of eating disorders: Anorexia Nervosa, Bulimia Nervosa, Binge eating disorders, Anorexia athletic, Body dysmorphic disorder, Muscle dysmorphic disorder (bigorexia), Orthorexia nervosa, Pregorexia, Drunkorexia, Infection-triggered, auto immune subtype of anorexia nervosa in young children, Night-eating syndrome, Rumination syndrome, Gourmand syndrome, Prader-Willi syndrome, Pica, Cyclic vomiting syndrome, Chewing and spitting.

Chapter 4. Diabetes Mellitus and Nutritional Care

Etiology, classification, pathophysiology symptoms and diagnosis - i) Blood glucose monitoring-GTT, FBS, PPBS, RBS ii) Glycosylated hemoglobin iii) Urine testing Management of DM, Blood sugar lowering agents- Oral hypoglycemic agents, Insulin therapy, Nutritional management- Diet planning for Type1, Type2, For Special conditions–Pregnancy, Elderly and Surgery. Acute complications – pathophysiology, diagnosis, types, treatment - Hypoglycemia, Hyperglycemia, Ketoacidosis, Somogyi

effect and Dawn phenomenon. Chronic complication - pathophysiology, diagnosis, types, and treatment – Atherosclerosis, Nephropathy, Neuropathy, Retinopathy and infections

Chapter 5. Cardiovascular Diseases and Nutritional Care

Blood pressure - Regulation, Short-term (sympathetic nervous system) and long-term (kidneys) Hypertension – classification (secondary and essential) Risk Factors for hypertension, Dietary management-DASH approach. Hyperlipidemia and Hyperlipoproteinemia- Classifications, dietary management. Atherosclerosis – Etiology and understanding the pathogenesis. Coronary Heart Disease - Angina Pectoris and Myocardial Infarction - Clinical manifestation and importance of cardiac enzymes to aid in the detection of CHD - Dietary Management Congestive Heart Failure - Pathogenesis - Pathogenesis of sodium and water retention Risk factors, Clinical manifestation Cardiac Cachexia Treatment - Nutritional Care Cerebrovascular Disease and Peripheral Vascular Disease - In brief etiology and dietary care. Rheumatic and Congenital Heart Disease - Clinical manifestation, pathogenesis and nutritional care

Chapter 6. Nutritional Anemias and Nutritional Care

Erythropoiesis and haemoglobin synthesis, Nutrients involved in Erythropoiesis Classifications, symptoms of Anemias and Nutritional Care. Normocytic anemia – aplastic anemia, Megaloblastic anemia, Microcytic anemia Sickle cell anemia and Thalassemia, Hemolytic anemia.

Chapter 7. Disease of Musculoskeletal System and Nutritional Care

Arthritis, osteoarthritis, osteoporosis, Gout, Dental Caries.

Chapter 8. Cancer and Nutritional Care

History of cancer, development of cancer, characteristics and identification of cancers. Carcinogens in foods, Etiology and Pathogenesis of carcinogenesis. Metabolic and Nutritional Alterations in Malignancy. Types of therapy and their side effects. Nutritional impacts of cancer therapy. Bone Marrow Transplant and its nutritional care. Nutritional requirement of the Cancer patient

Practical

- Preparation of energy restricted diet.
- Diet prescription and preparation for diabetic patients.
- Diet prescription and preparation for atherosclerotic patients.
- Diet prescription and preparation for hypertensive patients.
- Diet prescription and preparation for anemic patients.
- Diet prescription and preparation for osteoporosis and Dental caries.
- Diet prescription and preparation for cancer patients.

7.7.3 Further readings (Books)

- Raymond, Janice L., and Kelly Morrow. Krause and Mahan's Food and the Nutrition Care Process. Elsevier Health Sciences, 2020. 15th .Edition.
- Nelms, Marcia, and Kathryn P. Sucher. "Nutrition Therapy and Pathophysiology." (2019). 4th Edition. Rolfes, Sharon Rady, Kathryn Pinna, and Ellie Whitney. Understanding Normal and Clinical Nutrition. Cengage learning, 2014. 12th Edition

7.7.4 Journals & Websites

- Nutritional journal
- Public health nutrition
- Advances in nutrition

7.8 HUN: Nutritional Epidemiology in Public health

(3 + 0 Credit Hrs)

This course is designed for graduate students who are interested in conducting or better interpreting epidemiological studies relating diet and nutritional status to disease and health. There is an increasing awareness that various aspects of diet and nutrition may be important contributing factors in chronic disease. There are many important problems, however, in the implementation and interpretation of these studies. The purpose of this course is to examine methodologies used in nutritional epidemiological studies, and to review the status of knowledge regarding diet and other nutritional indicators as etiologic factors in disease.

7.8.1 Course objectives

Upon successful completion of this course, student will be able to

- Know and understand common measures of diseases frequencies and disease associations
- Know and understand common epidemiological research designs.
- Evaluate relationship between diet and disease association using common epidemiological measures of associations.
- Plan a research project using proper research design.

7.8.2 Course contents

Course Description: This course is designed for graduate students who are interested in conducting or better interpreting epidemiological studies relating diet and nutritional status to disease and health. There is an increasing awareness that various aspects of diet and nutrition may be important contributing factors in chronic disease. There are many important problems, however, in the implementation and interpretation of these studies. The purpose of this course is to examine methodologies used in nutritional epidemiological studies, and to review the status of knowledge regarding diet and other nutritional indicators as etiologic factors in disease.

Chapter 1: Overview of Nutritional Epidemiology

Scope/Objective of nutritional epidemiology research, types of study designs used in nutritional epidemiological research, types of measures of nutritional exposure and outcome,

key issues in nutritional epidemiology, levels of prevention, Epidemic versus endemic disease

Chapter 2: Measurement of morbidity and mortality

Rates, ratios, and proportions, Incidence and prevalence rates, Crude, specific, and adjusted rates, Major sources of errors in measurement of disease, Infant and neonatal mortality, Fetal and perinatal mortality, Maternal mortality, Life expectancy.

Chapter 3: Nutritional Status Assessment

Anthropometric (WFH, HFA, WFA, MUAC, Z-Score etc and its interpretation), Biochemical (Blood, Urine, Saliva, Stool etc), Clinical and Dietary approaches, Common variations in dietary assessment, And how do these variations affect the validity and reliability in dietary assessment, 24-hour diet recall and food record, Food Frequency questionnaire, Advantages and disadvantages of diet recalls and records in assessing diet.

Chapter 4: Nutrition Biomarkers

Important considerations relating to the use of nutritional biomarkers, Advantages of using biomarkers in nutritional epidemiology, Difference between a direct and surrogate biomarker of exposure, Definition of validity, relative validity, calibration & reproducibility, principal behind the trial comparison methods of evaluating a FFQ, Surrogate biomarkers used in epidemiological studies, underlying assumptions on the use of biomarkers in epidemiological studies.

Chapter 5: Dietary Patterns and quality: Theoretical

Dietary pattern techniques to capture diet (Principal Component Analysis), Types of food pattern methods used in nutritional epidemiology, diet quality assessment (Different indices such as HEI (healthy eating Index), AHEI (alternative healthy eating index), DQI (diet quality index) etc), Considerations in creating a diet index score, Interpretation of the results of studies using theoretically derived dietary patterns

Practical

- Overview and orientation about any data analysis software such as SPSS, STATA etc
- Data Set analysis for Descriptive and Inferential Statistics
- Calculation of Nutrients from Food using software such as Nutri-survey, Windietetc
- Calculation of Z-Score by using Anthro and Anthro-plus software, .

7.8.3 **Recommended readings (Text books)**

- Nutritional epidemiology, willet, W.C (Editor)

7.8.4 **Journals, periodicals, and web sources**

- Comprehensive Reviews in Food Science and Food Safety
- Food Microbiology
- FAO website

7.9 [HUN 753: Advance Nutritional Epidemiology](#)

(2 + 0 Credit Hrs)

HUN 712 is an advance optional course for MPhil Human Nutrition students. The course will provide in-depth understanding of data-handling of several types of nutritional data including food composition, anthropometric and dietary intake data along with other exposure/lifestyle variables. Use of existing food composition tables will be demonstrated for assessment of macro as well as micro-nutrient intakes. WHO Anthro and Anthro-plus will be used for analysis of anthropometric data. Use of statistical software R and SAS will be demonstrated. For

practice, different datasets will be analyzed using these softwares to investigate association between dietary intake and health outcomes. Students are expected to have basic statistical knowledge and should be comfortable with running linear and logistic regression models.

7.9.1 Course objectives

Upon successful completion of this course, student will be able to

- Know and understand handling of various type of nutritional data using appropriate software.
- Use food composition tables for research purposes.
- Know application of various statistical methods using statistical softwares like R and SAS.
- Analyze nutritional data using appropriate software.

7.9.2 Course contents

The course contents of this subject include; Introduction to food composition tables and how they are developed, use of food composition tables, introduction to anthropometric data analysis, use of WHO Anthro and WHO Anthro-plus, Introduction to dietary intake data analyses, use of statistical software R and SAS for data-analysis.

7.9.3 Recommended readings (Textbooks)

- Essential medical statistics by Betty Kirkwood and Jonathan Sterne (2003). Wiley-Blackwell

7.9.4 Journals, periodicals and web sources

- International Network of Food Data System (FAO). <http://www.fao.org/infoods/infoods/tables-and-databases/en/>
- A Handbook of Statistical Analyses Using R by Brian S. Everitt and Torsten Hothorn. <http://www.ecostat.unical.it/tarsitano/Didattica/LabStat2/Everitt.pdf>
- SAS Learning Modules, Institute for digital research and education. <https://stats.idre.ucla.edu/sas/modules/>

