

Master's Degree curriculum in Clinical and Public Health Nutrition

Overview, structure, syllabus, evaluation

Key information

- **Duration:** 18 months
- **Language:** English
- **Credits:** 25 (core module: 13, dissertation: 12)

Overview

The Clinical and Public Health Nutrition program offered at the National Nutrition and Food Technology Institute provides a comprehensive overview of nutrition in modern clinical practice and the application of evidence based nutritional support across the community and offers specialized training in the clinical and scientific basis of under and over nutrition, and therapeutic approaches to correcting this in the clinic, community and educational setting.

This MSc is suitable for candidates who wish to pursue a career in cutting-edge research and/or practice of nutrition therapy in the health services. We also aim to provide an ideal foundation for graduates who wish to undertake a PhD.

Title

Clinical and Public Health Nutrition

Degree

MSc

Admission requirement

The applicants must hold at least B.Sc. in nutrition. Higher education degrees will be given preference. Applicants with other backgrounds than nutrition including public health, medicine, dentistry, veterinary, pharmacy, nursing and midwifery are also welcomed. Students from a non-nutrition background are welcome to apply but they will be invited to complete the Fundamentals of Nutrition and Metabolism course, which has 3 credits, 51 hours.

Employment Status of Graduates

Destinations and job roles of recent graduates include:

- Nutritionist
- Nutrition Support and Research Dietitian
- Lecturer in Nutrition
- Health Programmes Manager
- PhD student
- Researcher

Language

The English language level for this program is: Standard

Credits

The program consists of seven core modules (13 credits) and a research dissertation (12 credits).

Upon successful completion of 25 credits, students will be awarded a MSc in Clinical and Public Health Nutrition.

Core module

Code	Term	Credits		Hours	
		Theoretical	practical	Theoretical	practical
Applied Nutrition	1	2		34	
Biostatistics	1	2		34	
Practical Nutrition Assessment	1	2		34	
Research Methodology	1	2		34	
Public Health Nutrition	1	2		34	
Laboratory Methods	1	2		34	
Seminar	2	-	1	-	
Research Project (Thesis)	2		6		
Research Project (Thesis)	3		6		

Non-core module

Non-core modules will be provided based on the topic of students' thesis.

Program Structure and features, modules, credit assignment and award requirements:

Full-Time M.Sc.	Semester 1	Semester 2	Semester 3	Total credits
Core modules	12	1	---	13
Dissertation	---	6	6	12

Evaluations:

The students will be evaluated through individual module assessments (which may include essays, other written coursework, short written exams, practical exams, group-work, presentations or other methods), formal summer exams, and a project report. Such tasks are designed to assess, via the most appropriate method, whether learning objectives have been met.

Modules:

Applied Nutrition Syllabus

Course title:

Applied Nutrition

Prerequisite or co-requisite: None

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research; Department of Clinical Nutrition and Dietetics, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences.

Description: Interpret, evaluate, communicate and apply complex nutritional concepts to a wide variety of individuals with obesity, thinness, cardiovascular diseases and endocrine disorders.

Learning objectives:

By the end of this course, student will be able to:

- Be expert in the diet therapy of obesity, thinness, cardiovascular and endocrine diseases
- Provide the necessary dietary advises in obesity, thinness, cardiovascular and endocrine diseases, and athletics.

Outlines

Sessions	Topics	Reference/ chapter	Hours
1.	An overview of nutrition assessment	Ref 6 (4 & 5)	2
2.	An overview of disease status assessment (obesity, thinness, cardiovascular diseases and endocrine disorders)	Ref 6 (4 & 5)	2
3.	Pathophysiology of obesity	Ref 1 (1)	2
4.	Diet therapy in weight management (1)	Ref 1 (1) Ref 6 (21)	2
5.	Diet therapy in weight management (2)	Ref 2 (6)	2
6.	Pathophysiology of diseases of cardiovascular diseases	Ref 3 (2)	2
7.	Diet therapy in cardiovascular diseases: lipid abnormalities, hypertension	Ref 6 (33) Ref 4 (64)	2
8.	Diet therapy in cardiovascular diseases: heart failure, cardiomyopathy	Ref 4 (65)	2
9.	Diet therapy in cardiovascular disease: peripheral vascular disease, heart transplantation	Ref 4 (66)	2
10.	Pathophysiology of endocrine disorders	Ref 4 (61) Ref 5 (1)	2
11.	Diet therapy in type 1 diabetes, type 2 diabetes and hypoglycemia	Ref 5 (5,6) Ref 6 (30)	2
12.	Diet therapy in type diabetic gastroparesis and metabolic syndrome	Ref 5 (18) Ref 6 (30)	2
13.	Diet therapy in pregnant and lactating mothers, mothers with preeclampsia, gestational diabetes	Ref 5 (9)	2
14.	Diet therapy in athletes (healthy and diabetic)	Ref 6 (23)	2
15.	Diet therapy in polycystic ovary syndrome, adrenal disorders, growth hormone secretion disorders, thyroid disorders	Ref 6 (31)	2
16.	Diet therapy in pheochromocytoma, diabetes insipidus, antidiuretic hormone over secretion syndrome, parathormone disorders	Ref 6 (31)	2

References:

1. Nonas, C., Foster, G. D. Managing Obesity: A Clinical Guide. United States: American Dietetic Association. Last edition.
2. Shield, J. E., Mullen, M. C. ADA Pocket Guide to Pediatric Weight Management. United States: American Dietetic Association. Last edition.
3. Burke, F. M., Hark, L., Carson, J. A. S. Cardiovascular Nutrition: Disease Management and Prevention. United States: American Dietetic Association. Last edition.
4. Ross, A. C. Modern Nutrition in Health and Disease. United States: Wolters Kluwer Health/Lippincott Williams & Wilkins. Last edition.
5. American Diabetes Association Guide to Nutrition Therapy for Diabetes. United States: American Diabetes Association. Last edition.
6. Raymond, J. L., Krause, M. V., Escott-Stump, S. Krause's Food & the Nutrition Care Process. United Kingdom: Elsevier/Saunders. Last edition.

Biostatistics Syllabus

Course title:

Biostatistics

Prerequisite or co-requisite: None

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Biostatistics department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences; Nutrition Research department, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences.

Description: This course introduces the basic principles and methods of biostatistics, providing students a sound methodological foundation for public health and clinical practice.

Learning objectives:

By the end of this course, student will be able to:

- Describe the fundamental concepts and techniques of descriptive and inferential statistics with applications in health care, medicine, public health, and epidemiology.
- Describe basic statistics, including probability, descriptive statistics, and inference for means and proportions, and hypothesis testing
- Apply and link the analytic methods to topics including health promotion, epidemiology, and program evaluation.

Outlines

Sessions	Topics	Reference/ chapter	Hours
1	Appropriately utilize qualitative and quantitative data in order to effectively address public health and clinical problems,	1.chapter 1 2. chapter 38	2
2	Introduction to Data / Study Designs	2. chapter 3, 4	2
3	Introduction to statistics, Data collection, Introduction to software,	1.chapter 1	2
4	Types of Data, Organizing and Summarizing Data,	1.chapter 1	2
5, 6	Descriptive Statistics, Central tendency & dispersion, Categorical Data	1.chapter 2, 3 2.chapter 4	4
7, 8	Normal distribution, Statistical inference: Samples and populations, Power, Confidence intervals, p-values, Type I & II error	1.chapter 3, 5	4
9	Inference for Numerical Data: One sample t-tests	2. chapter 7, 8 1.chapter 5	2
10	Inference for Numerical Data: Paired sample t-test	2. chapter 7, 8 1.chapter 5	2
11	Inference for Numerical Data: Independent samples t-test	2. chapter 7, 8 1.chapter 5	2
12, 13	Inference for Numerical Data: Comparing Three or More Means Analysis of Variance (ANOVA)	2. chapter 9 1.chapter 6	4
14	Non-parametric Tests: Sign test, Wilcoxon test	1.chapter 4	2
15	Non-parametric Tests: Kruskal-Wallis test	1.chapter 4	2
16	Non-parametric Tests: Rank correlation	1.chapter 4	2

References:

- 1- Barbara Hazard Munro, Statistical Methods for Health Care Research, Lippincott Williams & Wilkins, 2005
- 2- Betty R. Kirkwood, Jonathan A. C. Sterne, Essential Medical Statistics, Wiley, 2010

Practical Nutrition Assessment Syllabus

Course title:

Practical Nutrition Assessment

Prerequisite or co-requisite: Basic Nutrition, Nutrition Physiology

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences

Description:

Nutritional Assessment includes the study of the methods to accurately assess the nutritional status at the individual and population wide levels and introduces the practical application of these concepts in health and disease. Students conduct nutritional assessment using a variety of methods including dietary food records, anthropometry, and biochemical methods.

Learning Objectives:

By the end of this course, student will be able to:

- Demonstrate knowledge of nutritional assessment and monitoring, use of nutritional reference standards and guidance systems.
- Acquire knowledge about qualitative and quantitative dietary assessment methods and evaluate them against the Dietary Guidelines.
- Gain an understanding of the advantages and disadvantages of various approaches used to evaluate the nutritional status of individual and communities.

- Identify and describe basic training in common anthropometric methods.
- Gain an understanding of the appropriate applications of biochemical and clinical methods and interpretation of results in nutritional assessment of individuals and population.

Outlines:

sessions	Topics	Reference/ chapter	Hours
1.	<p>Introduction: Nutritional Screening and Assessment Methods</p> <p>Reasons for measuring diet Approaches to measuring diet Techniques in measuring diet; advantages and limitations</p> <p>1- Memory Based Techniques</p> <p>24-Hour Recall Food Frequency Questionnaire Diet History Questionnaire</p>	1. Chapter 3 2. Chapter 4	2
2.	<p>2- Non-memory Based Techniques</p> <p>Food Record Food Account Food Balance Sheet</p> <p>3- Qualitative Methods</p> <p>Telephone Interviews Computerized Techniques Photographic and video records</p> <p>4- common errors in dietary assessment</p>	1. Chapter 3 2. Chapter 4	2
3.	<p>Validation and Implementation of Food Intake Data</p> <p>Validation of Food Intake Assessment Methods (Validity and Reproducibility)</p> <p>Methods of Collection and Interpretation of Food Consumption Data</p>	1. Chapter 2	2

sessions	Topics	Reference/ chapter	Hours
	Estimating Portion Size Food Composition Tables Dietary Reference Intake (DRI) Food Guides Nutrition Facts Label		
4.	Indices of Diet Quality Healthy Eating Index Diet Quality Index Index of Nutrient Quality	1. Chapter 3	2
5.	Computerized Dietary Analysis Systems and Software	1. Chapter 5	2
6.	Anthropometry Measuring Length, Stature, Weight and Head Circumference in Age Groups Common Errors in Measurement Measuring Frame size Weight-Height Indices	1. Chapter 6	2
7.	CDC Growth Charts Weight Standards Height-Weight Tables Age-Specific Weight standards Limitations of Height-Weight Tables Strengths of Height-Weight Tables	1. Chapter 6 3. 4.	2
8.	Body Fat distribution Body Composition Skinfold Measurement Assumptions in Using Skinfold Measurements Measurement Technique Site Selection	1. Chapter 6	2
9.	Densitometry Underwater Weighing	1. Chapter 6	2

sessions	Topics	Reference/ chapter	Hours
	Air Displacement Plethysmography Total Body Water Total Body Potassium Neutron Activation Analysis Creatinine Excretion 3-Methyhistidine Electrical Conductance Infrared Interactance Ultrasound Computed Tomography Magnetic Resonance Imaging Dual-Energy X-Ray Absorptiometry		
10.	Assessment of the Hospitalized Person	1.Chapter 7	2
11.	Nutritional Assessment in Disease Prevention	1.Chapter 8	2
12.	Biochemical Assessment of Nutritional Status Biochemical Assessment of Protein Status Assessment of Immunity	1.Chapter 9 2.Chapter 5	2
13.	Iron, Zinc and Calcium Status	1.Chapter 9 2.Chapter 5	2
14.	Vitamin B12, Vitamin C and Folic acid Status	1.Chapter 9 2.Chapter 5	2
15.	Vitamins B ₁ ,B ₂ ,B ₃ ,B ₆ Status	1.Chapter 9 2.Chapter 5	2
16.	Vitamins A, D, E, K Status	1.Chapter 9 2.Chapter 5	2

References:

- 1- Lee, R.D., and D.C. Nieman. 2010. Nutritional Assessment. 5th edition, McGraw-Hill, Boston.
- 2- Krause's Food & The Nutrition Care Process 16th Edition
- 3- <http://www.who.int/childgrowth/en/>
- 4- WHO: Department of Nutrition for Health and Development 2007. WHO Child Growth Standards: Methods And Development. WHO Library.

Basic Research Methodology Syllabus

Course title:

Basic Research Methodology

Prerequisite or co-requisite: None

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Epidemiology department, School of Public health and safety, Shahid Beheshti University of Medical Sciences; Nutrition Research department, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences.

Description:

This course is designed to introduce new M.S. students to a selection of research topics and tools commonly used in the fields of nutrition and food sciences. Topics to be covered include methods of literature review, data analysis and presentation, and research ethics. In addition, the course will include an introduction to various types of food and nutrition research, including behavioral research, qualitative research, and clinical trials research.

Learning objectives:

By the end of this course, student will be able to:

- Select research topics and tools used in the fields of nutrition and food sciences
- Describe methods of literature review, data analysis and presentation, and research ethics.
- Identify and use various types of food and nutrition research

Outlines:

sessions	Topics	Reference/ chapter	Hours
1.	Introduction: Foundations of Research, Meaning, Objectives, Motivation, Utility. S	1.chapter 1	2
2.	Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process	1.chapter 1	2
3.	Problem Identification & Formulation – Research Question – Investigation Question – Measurement Issues –	1.chapter 1	2
4.	Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis.	1.chapter 1	2
5.	Research Design: Concept and Importance in Research – Features of a good research design –1	1.chapter 4, 5	2
6.	Research Design: Concept and Importance in Research – Features of a good research design –2	1.chapter 4, 5	2
7.	Exploratory Research Design – concept, types and uses, Descriptive Research Designs – concept, types and uses. Experimental Design: Concept of Independent & Dependent variables-1	1.chapter 4, 5	2
8.	Exploratory Research Design – concept, types and uses, Descriptive Research Designs – concept, types and uses. Experimental Design: Concept of Independent & Dependent variables-2	1.chapter 4, 5	2
9.	Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample.	1.chapter 6	2
10.	Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling-1	1.chapter 6	2

sessions	Topics	Reference/ chapter	Hours
11.	Determining size of the sample – Practical considerations in sampling and sample size.	1.chapter 6	2
12.	Data Analysis: Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association-1	1.chapter 6	2
13.	Data Analysis: Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association-2	1.chapter 6	2
14.	Interpretation of Data and Paper Writing – Layout of a Research Paper, Impact factor of Journals, When and where to publish? Plagiarism and Self-Plagiarism.	1.chapter 7	2
15, 16	Ethics in Research: What is Ethics in Research & Why is it Important? Ethical issues with Human subjects; ethical issues with animal studies. Codes and policies for research ethics; ethical decision making in research	3.chapter 3	4

References:

1. C. George Thomas, Research Methodology and Scientific Writing, Springer International Publishing, 2021
2. Walter Willett, Nutritional Epidemiology, OUP USA, 2013
3. Hilla Brink, Christa Van der Walt, Gisela Van Rensburg, Fundamentals of Research Methodology for Health Care Professionals, Juta, 2006

Public Health Nutrition Syllabus

Course title:

Public Health Nutrition

Prerequisite or co-requisite: Basic nutrition, public health, Nutrition assessment, lifespan nutrition

Credits: 2

Module type: Theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research, Research Department of Food and Nutrition Policy and Planning, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences

Description:

This course develops students' understanding of public health nutrition with a focus placed on the importance of building a sustainable, nutritious and healthy food supply for all. The overall goal of this course is to consolidate and extend knowledge and skills in public health nutrition. It will introduce the most current societal issues around public health nutrition and health promotion. It will focus on recognizing determinants of health, health disparities and availability and accessibility of resources influence the nutrition status of communities and state, country and regional programs. Program planning and population needs assessments are addressed.

Learning objectives:

By the end of this course, student will be able to:

- Understand the unifying concepts of public health nutrition, particularly with relevance to health promotion and disease prevention efforts
- Identify current issues and areas of research in public health nutrition and health promotion
- Describe the most important public health nutrition problems in high- income and low-income countries respectively, and discuss long term and short term countermeasures
- Conduct food and nutritional assessment of the community.
- Identify the determinants for dietary habits and relate these to individual, social, cultural and economic factors
- Critically analyze factors which impact on food choices and eating patterns
- Formulate and design an innovative food and nutrition intervention project
- Identify and discuss the role and impact of different policy documents, international agreements and regulations of importance for public health nutrition activities on a national and international level

Outlines:

Session	Title	Reference/ chapter	Hours
1	Defining health & introducing public health nutrition The role of nutrition in health promotion.	1.Chapter 1,2 5. chapter 1	2
2	Objectives of, and services provided by the community nutrition programs	1.Chapter 2 5. chapter 11	2
3	Current initiatives in public health nutrition The most current and controversial issues in the field	3. chapter 14, 17	2
4	Food systems, building a healthy sustainable food supply	3. chapter 5, 6	2
5	Social determinants of health & impact on nutritional status	3. chapter 4	2
6	Food choices, Food, Culture, Behavior & Health	3. chapter 4 4. chapter 8	2
7	Goals of a community needs assessment Nutritional needs assessment	2. Chapter 4, 15 3. chapter 11	2
8	Different methods for assessing nutritional status and health in the community	1.Chapter 3 5. chapter 3	2
9, 10	Nutrition intervention programs – Designing and implementing	2. Chapter 15 3. chapter 12 4. chapter 5	2
11, 12	Evaluation of a community nutrition program	2. Chapter 15 3. chapter 13	2
13, 14	Nutrition interventions in low- and middle-income countries	3. chapter 14	2
15, 16	Process of policy-making and developing legislative and regulatory	1.chapter 8 5. chapter 7	2
17	Current food and nutrition policies and initiatives to real- world contexts	1.chapter 8 3. chapter 5	2

References

1. Spark A, Lauren M. Dinour, Janel Obenchain. Nutrition in Public Health Principles, Policies, and Practice, Second Edition. 2021. CRC Press
2. Boyle MA. Community nutrition in action: an entrepreneurial approach: Cengage Learning; 2016
3. Barth M, Bell RA, Grimmer K. Public Health Nutrition: Rural, Urban, and Global Community-based Practice: Springer Publishing Company; 2020
4. M Gibney; M Barrie. Public Health Nutrition. Margetts and John M. Kearney (ed.) 2004.
5. M Kaufman. Nutrition in Promoting the Public's Health; Strategies, Principles, and Practices. 2007

Laboratory methods in nutrition assessment and research Syllabus

Course title:

Laboratory methods in nutrition assessment and research

Prerequisite or co-requisite: Basic nutrition, biochemistry (biomolecules and metabolism)

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of the Department of Nutrition Research, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences.

Description

This course introduces the basic principles of laboratory methods and their usage in nutritional science. The limitations of each method will also be discussed. Interpretation of laboratory findings will be taught through case studies. The student is expected to have an active contribution to the class through participation in discussions and presenting lectures.

Main aims: At the end of this unit, the student is expected to:

1. Name suitable laboratory tests for nutritional assessment for both clinical and research purposes
2. Interpret the results of the laboratory tests
3. Briefly describe the principle of the methods used to assess nutritional status
4. Briefly describe strengths and limitations of each method
5. Briefly describe the important considerations for biological sampling and handling, transportation and storage for laboratory tests commonly used in nutrition assessment

Outlines

Session	Title	Reference/ chapter	Hours
1	Introduction to the laboratory methods	1, 2/Introduction	2
2-3	Overview of some concepts and definitions Normal range, reference intervals, precision and accuracy	4/14, 16	4
4-6	Biological sampling and handling, transportation and storage	3	6
7	Biobanks	4, 5	2
8-9	Hematological tests: Hb, Hct, indices	2/3	4
10-11	Immunoassays: immunoradiometric assay, enzyme immunoassay	7/9	4
12-13	Clinical laboratory tests: assessment of glycemic and lipidemic status	6/20-25	4
14-15	Laboratory tests for assessment of vitamin status	7/25-26; 8/5	4
16-17	Laboratory tests for assessment of mineral status	8/7; 1/2-13	4

References

1. Sauberlich HE. Laboratory Tests for the Assessment of Nutritional Status. 2nd ed., 2018. <https://doi.org/10.1201/9780203749647>
2. Pagana KD, Pagana TJ. Manual of diagnostic and laboratory tests. 6th ed., Mosby, 2018
3. Rifai N. Tietz Textbook of Laboratory Medicine. 7th ed., Elsevier, 2022
4. Fidanza F. Nutritional Status Assessment: A manual for population studies 1st ed., Springer, 1991.

Seminar syllabus

Credits: 1

Module type: Practical

Instructor(s)/Department(s): Faculty members of the Department of Nutrition Research, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences.

Description

In this course, students will have to present a lecture on a current problem of clinical or public health nutrition using critical search and data analysis under the supervision of the instructor(s).

Research Project Syllabus

Module title: Research Project (Thesis)

Credits: 6

Module type: Practical

Description

The students will conduct an original research on a hot topic in clinical or public health nutrition under the supervision of the instructor(s). Multidisciplinary project are specifically encouraged.