

**VANITA VISHRAM WOMEN'S UNIVERSITY
SCHOOL OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE
DEPARTMENT OF FOOD AND NUTRITION**

MASTERS IN NUTRITION AND DIETETICS



**VANITA VISHRAM
WOMEN'S UNIVERSITY**
— SURAT —

**Under Learning Outcomes-based Curriculum Framework
(LOCF) for Post Graduate (PG) Education**

**SEMESTER III
Core Courses (CC)**

*Syllabus applicable to the students seeking admission in the
following program*

**MASTERS IN NUTRITION AND DIETETICS under LOCF
w.e.f. the Academic Year 2024-2025**

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1. PREAMBLE – VVWU

Vanita Vishram Women’s University (VVWU) is the First-ever Women’s University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a University committed to achieve Women’s Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

2. INTRODUCTION OF THE PROGRAM

The program on Masters in Nutrition and Dietetics focuses on facilitating students to understand the concepts of Diet and Nutrition to further contribute as nutritionists. They need to apply knowledge drawn from relevant sciences to promote an understanding of the effects of nutrition on growth, development, and well-being. It is further strengthened with project work and internships in the food industry, hospitals & public nutrition area. A component of Research is the feature that makes the student think in an innovative manner and thus apply the skills in active research.

3. PROGRAM SPECIFIC OBJECTIVES (PSOs)

- Introduce the students to the advanced aspects of Nutrition Science and Dietetics.
- Make them understand the role as a Nutritionist or a dietitian in preventive and therapeutic aspects of Health care management.
- Develop skills wherein they understand the role of various foods, nutrients they provide and imply innovative methods in food product development.
- Create awareness among them about the current and future trends in the industry and help to determine food safety and entrepreneurship.
- Create awareness about the need for Nutrition in Community emphasizing the role of Public Health Nutrition.

4. PROGRAMME SPECIFIC OUTCOMES (PSOs)

- Students will be equipped with the advanced skills and knowledge that are essential for functioning in the field of Nutrition and Dietetics.
- They will develop professional behavior and competencies in handling hospital setups, counseling, and food handling.
- They will also develop a scientific outlook towards the research in this field and do active research.
- Students will be able to guide and counsel the people in the community, thereby helping in prevention of nutrient deficiencies.
- They will develop competencies that will enable them to focus on various startups, government or non-government organizations.

5. CREDIT STRUCTURE OF THE PROGRAM

Masters in Nutrition and Dietetics - Structure & Distribution of Courses													
Courses	Theory (Credits)	Practical (Credits)	Courses	Theory (Credits)	Practical (Credits)	Courses	Theory (Credits)	Practical (Credits)	Courses	Theory (Credits)	Practical (Credits)	Total Theory & Practical Credits	Total yearly Credits
SEM I			SEM II			SEM III			SEM IV				
FN21210 Human Physiology	4	-	FN21270 Micronutrients	4	-	FN21330- Research Methodology and Biostatistics	4	-	FN21380- Public Health Nutrition	4	-	56 + 40	96
FN21220 Nutritional Biochemistry	4	-	FN21280 Food Safety and Toxicology	4	-	FN21340- Family Meal Management	4	-	FN24050- Nutrigenomics FN24060- Enteral and Parenteral Nutrition	4	-		
FN21230 Therapeutic Nutrition I	4	-	FN21290 Sports Nutrition	4	-	FN21350- Food Microbiology	4	-	FN21390- Recent Advances	-	4		
FN21240 Macronutrients	4	-	FN21300 Therapeutic Nutrition II	4	-	FN24010- Alternate Therapies/ FN24020- Pathology and Pharmacology	4	-	FN21400- Dissertation	-	12		
FN21250 Therapeutic Nutrition I (Pr)	-	4	FN21310 Therapeutic Nutrition II (Pr)	-	4	FN21360- Food Analysis	-	4					
FN21260 Innovations in Food Product Development (Pr)	-	4	FN21320 Dietetic Techniques and Internship (Pr)	-	4	FN21370- Project Work	-	4					
	16	08		16	08		16	08		08	16		

6. COURSE STRUCTURE OF THE PROGRAM

Semester	Course Category	Course Code	Subject Name	Credit	Total Credit
I	CC	FN21210	Human Physiology (Th)	4	24
	CC	FN21220	Nutritional Biochemistry (Th)	4	
	CC	FN21230	Therapeutic Nutrition I (Th)	4	
	CC	FN21240	Macronutrients (Th)	4	
	CC	FN21250	Therapeutic Nutrition I (Pr)	4	
	CC	FN21260	Innovations in Food Product Development (Pr)	4	
II	CC	FN21270	Micronutrients (Th)	4	24
	CC	FN21280	Food Safety and Toxicology (Th)	4	
	CC	FN21290	Sports Nutrition (Th)	4	
	CC	FN21300	Therapeutic Nutrition II (Th)	4	
	CC	FN21310	Therapeutic Nutrition II (Pr)	4	
	CC	FN21320	Dietetic Techniques and Internship (Pr)	4	
III	CC	FN21330	Research Methodology and Biostatistics (Th)	4	24
	CC	FN21340	Family Meal Management (Th)	4	
	CC	FN21350	Food Microbiology (Th)	4	
	DSE 1	FN24010	Alternate Therapies (Th)	4	
		FN24020	Pathology and Pharmacology (Th)		
	CC	FN21360	Food Analysis (Pr)	4	
CC	FN21370	Project Work (Pr)	4		
IV	CC	FN21380	Public Health Nutrition (Th)	4	24
	DSE 2	FN24050	Nutrigenomics (Th)	4	
		FN24060	Enteral and parenteral Nutrition (Th)		
	CC	FN21390	Recent Advances in Nutrition (Pr)	4	
CC	FN21400	Dissertation (Pr)	12		

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
CORE COURSE**

FN21330-RESEARCH METHODOLOGY AND BIOSTATISTICS	
Course Objectives The course will enable the student to learn	
<ol style="list-style-type: none"> 1. To recognize the importance of malnutrition as an obstacle for community development. 2. To understand various methods of assessment of nutritional status in the community. 3. To be familiar with strategies and programs for improving nutrition and health of vulnerable groups in the community. 	
Course Outcome: This course will help to get in depth knowledge about various public health agencies, strategies to improve public health status.	
FN21330- RESEARCH METHODOLOGY AND BIOSTATISTICS THEORY COURSE CONTENTS (4 CREDIT)	
S.No.	STRUCTURE
Unit 1	Objectives of research <ul style="list-style-type: none"> ● Definition, objectives, types of research, quantitative and qualitative research in food and nutrition
Unit 2	Basic principles of research design <ul style="list-style-type: none"> ● Meaning and need ● Types of research designs – exploratory, descriptive, experimental, survey and case study, cross-sectional and longitudinal ● Study design issues, sampling methods and sample size
Unit 3	Instruments of data collection <ul style="list-style-type: none"> ● Observation, questionnaire, interview: reliability and validity of measuring instruments ● Data management and quality control ● Ethical Clearance
Unit 4	Introduction to computer application software <ul style="list-style-type: none"> ● MS Word ● MS Excel ● SPSS
Unit 5	Introduction to biostatistics in food and nutrition research <ul style="list-style-type: none"> ● Orientation to qualitative and quantitative analysis ● Introduction to quantitative procedures ● Basic principles and concepts in statistics ● Fundamentals of measurement quantity and quality ● Scales of measurement: Nominal, ordinal, interval and ratio
Unit 6	Organization and presentation of data <ul style="list-style-type: none"> ● Data reduction strategies ● Coding and tabulation ● Grouping of data: Frequency distribution ● Graphic representation: Graphs, diagrams and charts
REFERENCES	
<ol style="list-style-type: none"> 1. C.R. Kothari & Gaurav Garg, Research Methodology (Third Edition), 2010 New Age publishers by September 2019. 	

2. C. William Emory, Richard D. Irwin. Business Research Methods: Tata McGraw Hill New Delhi.
3. O. R. Krishnaswami. 2012. Methodology of Research in Social Sciences, Himalaya Publishing House New Delhi.
4. Ram Ahuja, 2001 Research Methods.

TEACHING METHODOLOGY

- PowerPoint presentations
- Videos
- Chalk and talk method
- Guest Lectures
- Group discussions
- Quiz and Debate

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
CORE COURSE**

FN21340- FAMILY MEAL MANAGEMENT	
Course Objectives The course will enable the students to	
<ol style="list-style-type: none"> 1. Understand the interrelationship between Food, Nutrition and Health 2. To understand in brief the functions of food and various nutrients, their requirements, dietary sources, their deficiency and excess. 3. To be familiar with different methods of cooking, their advantages and disadvantages. 4. To gain knowledge of improving nutritional quality of food. 	
Course Outcome: This course will help the students to understand various nutrients required for the family and management of meal planning according to the requirements.	
FN21340- FAMILY MEAL MANAGEMENT THEORY COURSE CONTENTS (4 CREDITS)	
S.No.	STRUCTURE
Unit 1	Basics of Meal Planning <ul style="list-style-type: none"> ● Food Guide/Food Pyramid and its Uses ● Concept of Balanced Diet ● Factors affecting meal planning ● RDA in reference to various age groups
Unit 2	Meal planning and adequacy <ul style="list-style-type: none"> ● Meal and meal frequency ● Importance of meal planning for the family ● Food Budgeting ● Food Patterns ● Tradition, belief and myths
Unit 3	Nutrition in Adulthood <ul style="list-style-type: none"> ● Principles of Planning meal, Factors affecting Food acceptance and Diet ● Dietary requirements for Sedentary, Moderate and Heavy Workers ● Nutrient modifications and dietary goals. ● Dietary modifications for common ailments.
Unit 4	Nutrition during Pregnancy and Lactation <ul style="list-style-type: none"> ● Principles of Planning meal, Factors affecting, Food acceptance and Diet ● Planning meals for various physiological conditions like pregnancy and lactation.
Unit 5	Nutrition during Other stages <ul style="list-style-type: none"> ● Planning meals for different age groups; Infancy, Childhood, Adolescence and Old age ● Principles of Planning meal, Factors affecting, Food acceptance and Diet
REFERENCES	
<ol style="list-style-type: none"> 1. Mudambi, S. R., Rajgopal, M.V. (1990) Fundamentals of Foods and Nutrition, New Age International Pvt. Ltd. 2. Nutrient Requirements and Recommended Dietary Allowances for Indians- I.C.M.R. Publication 1999. 	

3. Guthrie Helen (1986) Introductory Nutrition. Times Mirror/ Mosby College Publishing.
4. Robinson, and Lawler. (1986) Normal and Therapeutic Nutrition. MacMillan Pub.Co.
5. Elenor N., Whitney S., Rady R. (1993): Understanding Nutrition, West Publishing Company, Minneapolis.
6. Wardlaw (1993): Perspectives in Nutrition, Paul Insel Mosby.
7. Bhatia Arti: Nutrition & Dietetics- Anmol Publication Pvt. Ltd. New Delhi.
8. Khanna K. (1998): The Art and Science of Cooking, Phoenix Publishing House Pvt. Ltd., New Delhi.

TEACHING METHODOLOGY

- PowerPoint presentations
- Videos
- Chalk and talk method
- Guest Lectures
- Group discussions
- Quiz and Debate

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
CORE COURSE**

FN21350- FOOD MICROBIOLOGY	
Course Objectives	
This course will enable students to	
<ol style="list-style-type: none"> 1. Develop a comprehensive understanding of food microbiology. 2. Identify and manage foodborne pathogens. 3. Evaluate food preservation and processing techniques. 4. Ensure food safety and quality assurance: Ensure food safety and quality assurance. 5. Apply critical thinking and problem-solving skills in food microbiology. 	
Course Outcome: Demonstrate a comprehensive understanding of microbial behavior in food systems, including factors influencing growth, survival, and control. Apply theoretical knowledge to assess and mitigate food safety risks, ensuring the production of safe and high-quality food products.	
FN21350- FOOD MICROBIOLOGY THEORY COURSE CONTENT (4 CREDIT)	
S.No.	STRUCTURE
Unit 1	Microorganisms and its role in food
	<ul style="list-style-type: none"> ● History of Microbiology - Proof of Biogenesis Germ theory and of fermentation - development of laboratory - Technique to study micro-organisms - pure Culture - isolation. ● General Characteristics of Bacteria, Viruses, Yeast, Moulds, protozoa, Algae. ● Bacteria: Bacterial cell Morphology and propagation in food ● Viruses, Yeast, Mould, Algae & Protozoa: Morphology and propagation in food
Unit 2	Microbiology of food poisoning, food infections, food and water borne diseases
	<ul style="list-style-type: none"> ● Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning. ● Food infections - Food and water borne diseases - Dysentery diarrhea, Typhoid, Cholera.
Unit 3	Contamination and spoilage
	<ul style="list-style-type: none"> ● Sea and marine foods ● Pulses ● Fruits and beverages
Unit 4	Control of Foodborne Pathogens:
	<ul style="list-style-type: none"> ● Principles of food preservation ● Physical methods (heat, radiation, filtration) ● Chemical methods (preservatives, sanitizers) ● Biological methods (probiotics, bacteriophages)
Unit 5	Laboratory Techniques in Food Microbiology:
	<ul style="list-style-type: none"> ● Microbial isolation and enumeration methods ● Identification of foodborne pathogens ● Detection of microbial contamination in food samples

	<ul style="list-style-type: none"> ● Quality assurance and control in food microbiology laboratories
Unit 6	Consumer Awareness and Education:
	<ul style="list-style-type: none"> ● Importance of consumer education in food safety ● Communication strategies for promoting safe food handling practices ● Role of social media and public outreach in food safety advocacy
Unit 7	Food Packaging and Microbiology:
	<ul style="list-style-type: none"> ● Role of packaging materials in food preservation and safety ● Microbiological considerations in the design and selection of food packaging ● Emerging packaging technologies for extending shelf life and preventing microbial contamination
REFERENCES	
<ol style="list-style-type: none"> 1. Doyle, M., Buchanan, R. L., & Demain, A. L. (2013). Food Microbiology: Fundamentals and Frontiers. ASM Press. 2. Montville, T. J., Matthews, K. R., & Doyle, M. B. (2005). Food Microbiology: An Introduction. ASM Press. 3. Erkmef, O., & Cabuk, T. (2016). Food Microbiology: Principles into Practice. Wiley-Blackwell. 4. Yousef, A. E., & Carlstrom, C. (2019). Food Microbiology: A Laboratory Manual. Wiley-Blackwell. 5. Doyle, M. P. (2020). Food Microbiology: An Introduction. Springer. 6. Jay, J. M., Loessner, M. J., & Golden, D. A. (2005). Modern Food Microbiology. Springer. 7. McMeekin, T. V., Ross, T., & Olley, R. A. (2000). Food Microbiology: An Introduction. Springer. 8. Barth, M., Montville, T., & Cox, C. (2007). Food Microbiology: Principles and Explorations. Wiley. 9. McLandsborough, L. (2017). Food Microbiology: A Laboratory Manual. Wiley. 	
TEACHING METHODOLOGY	
<ul style="list-style-type: none"> ● Powerpoint presentations ● Videos ● Chalk and talk method ● Guest Lectures ● Group discussions ● Quiz and Debate 	

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
DEPARTMENT ELECTIVE 1**

FN24010- ALTERNATIVE THERAPIES	
Course Objectives The course will enable the students to	
<ol style="list-style-type: none"> 1. This course explores the variety of options available today for use in the pursuit of holistic health. 2. Alternative therapies will be viewed as complementary to the existing medical system. 3. This course will look at the theories, clinical research, politics and controversies surrounding the use of various alternative healing modalities. 4. It will provide the student with information to evaluate the use of complementary therapies for healing and health maintenance 	
Course Outcomes	
<ol style="list-style-type: none"> 1. Compare and contrast the various forms of alternative therapies. 2. Evaluate current writings and research on alternative therapies. 3. Discuss cultural and religious beliefs as a basis for the use of alternative therapies. 4. Discuss the controversy over the use of alternative therapies in terms of political concerns and issues for the consumer. 	
FN24010- ALTERNATIVE THERAPIES THEORY COURSE CONTENT (4 CREDIT)	
S.No.	STRUCTURE
Unit 1	Meaning, definition, theories and practice of all alternative therapies.
Unit 2	Basic concepts of Ayurveda (dosh, dhatu, mala, agni and bala). Its explanation in science and modern medicine.
Unit 3	Meaning, definition, theories and practice of all Herbal medicines.
Unit 4	Meaning, definition, theories and practice of all Allopathic medicines.
Unit 5	Meaning, definition, theories and practice of Naturopathy.
Unit 6	Meaning, definition, theories and practice of Dietary supplementation.
REFERENCES	
<ol style="list-style-type: none"> 1. The Alternative Medicine Handbook: The Complete Reference Guide to Alternative and Complementary Therapies 1st Edition by Barrie R. Cassileth. 2. Complementary and Alternative Medicine by Steven B. Kayne. 3. Gale Encyclopedia of Alternative Medicine by Laurie J. Fundukian (Editor). 	
TEACHING METHODOLOGY	
<ul style="list-style-type: none"> ● Chalk and talk method ● PowerPoint presentations ● Videos, Quiz 	

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
CORE PRACTICAL**

FN21360- FOOD ANALYSIS (PR)	
Course Objectives This course will enable the students	
<ol style="list-style-type: none"> 1. Understand food analysis principles and importance. 2. Learn methods for analyzing food components. 3. Gain proficiency in instrumental analysis techniques. 4. Apply sensory evaluation for assessing food quality. 5. Comprehend regulatory requirements and standards. 	
Course Outcome: "Upon completion, students will demonstrate proficiency in analyzing food components using various techniques and understanding regulatory standards."	
FN21360-FOOD ANALYSIS PRACTICAL COURSE CONTENT (4 CREDIT)	
Sr.No	STRUCTURE
Practical 1	Introduction to Food Analysis <ul style="list-style-type: none"> ● Overview of the importance of food analysis in food science and industry. ● Basic principles of food analysis. ● Methods and techniques used in food analysis.
Practical 2	Estimation of moisture content from the given food sample by drying method or AOAC (Association of Analytical Chemist) Method
Practical 3	Estimation of oil or fat from the given food sample by soxhlet apparatus method or solvent extraction method.
Practical 4	Determination of Acid value of a given fat/ oil sample by NIN method.
Practical 5	Estimation of total ash from a given food sample by AOAC method.
Practical 6	Estimation of iron from a given food sample by dipyrindyl method of Ramsay (1954) method.
Practical 7	Estimation of calcium from a given food sample by titrimetric method of Clarke and Collip (1928).
Practical 8	Estimation of phosphorus from a given food sample by titrimetric method.
Practical 9	Estimation of crude fiber from a given food sample by dipyrindyl method of Ramsay (1954) method.
Practical 10	Estimation of Ascorbic acid from a given citrus fruit or unknown solution titrimetric method or 2-6, dichlorophenol indophenol method.
REFERENCES	
<ol style="list-style-type: none"> 1. S. Suzanne Nielsen - "Food Analysis Laboratory Manual" 2. Y. H. Hui and Ramesh Chandan - "Practical Food Analysis" - Publication Year: 1997 3. M. Elizabeth Swane - "Food Analysis Laboratory Manual" William Farrand Benton Jr. - "Laboratory Methods of Food Analysis" 4. Semih Otlés and David R. Labuza - "Handbook of Food Analysis Instruments" - Publication Year: 2008 5. Food Safety and Standards Authority of India (FSSAI) - "Good Laboratory Practices for Food Testing Laboratories" - 2018 	

6. American Public Health Association (APHA) - "Standard Methods for the Examination of Dairy Products"

TEACHING METHODOLOGY

- Chalk and talk method
- PowerPoint presentations
- Videos
- Models and posters
- Quiz
- Celebration of various days based on organs and systems

**MASTERS IN NUTRITION AND DIETETICS
SEMESTER III
CORE PRACTICAL**

FN21370- PROJECT WORK	
Course Objectives This course will enable the students	
<ol style="list-style-type: none"> 1. To train students to find reference material. 2. To train students to analyze, condense and evaluate articles/reports. 3. To understand the importance of different types of scientific writing /documentation. 4. To help students develop an ability to make effective presentations. 5. To develop competence in writing and abstracting skills. 	
Course Outcome: To help students learn how to search, write and present research papers.	
FN21370- PROJECT WORK- PRACTICAL COURSE CONTENT (4 CREDIT)	
Sr.No	STRUCTURE
Practical 1	<ul style="list-style-type: none"> ● Literature search and use of databases ● Styles and formats for writing references
Practical 2	Writing review of literature in an upcoming area and Review paper including bibliography
Practical 3	Writing a scientific paper including abstract and identification of key words.
Practical 4	Writing a research proposal for various funding agencies.
TEACHING METHODOLOGY	
<ul style="list-style-type: none"> ● Hands on practical training ● Report writing ● Class Presentation ● Group Discussion 	