AC – 07/07/2023
Item No. – 8.26(N)

As Per NEP 2020

University of Mumbai

Title of the programme

A- P.G. Diploma in Home Science – Dietetics and Applied Nutrition **2023 - 24**

Syllabus for Semester – I
Ref: GR dated 16th May, 2023 for Credit Structure of PG

Preamble

1) Introduction

From the late 1990s, there was recognition of the urgent need for trained dietitians in clinical and community settings in India. To address this need, a P.G. Diploma in Dietetics and Applied Nutrition was started in 1999 at the College of Home Science Nirmala Niketan with permanent affiliation to the University of Mumbai. Over the two decades, the Programme has yielded a growing cadre of trained (and after RD exam) registered dietitians, many of whom are heading the Diet Departments of nationally acclaimed hospitals in Mumbai and elsewhere.

Currently there are only about 30,000 qualified practicing dietitians in India for a 1.4 billion population. India stands with the burden of chronic degenerative diseases as a health emergency and duals the second burden of malnutrition. Health, wellness and lifestyle being on the forefront of the National Nutrition Mission as well as global sustainable development goals it is imperative therefore that dietetics as an integral field of public health nutrition be addressed on a high-priority basis. The field of dietetics being a newer field is very dynamic due to the multidisciplinary research emerging in this area leading to various newer techniques of medical nutrition therapy. It is therefore vital to have highly qualified dietetic professionals who will be able to transform individual and community health. With the awareness of the impact of epigenetic processes implied in chronic degenerative diseases, it is crucial to have highly qualified dietetic professionals with a strong background in clinical nutrition research and evidence-based practice to create sustainable health, dietary and lifestyle solutions. Moreover, healthcare currently encompasses many multi-disciplinary approaches which need to be incorporated into dietetic and nutrition practice in both clinics and communities.

Thus, this P.G. Diploma in Dietetics and Applied Nutrition is designed to provide an in- depth knowledge of both theoretical and practical components making it one of the courses that can lead to a contribution for both the individualised in-patient and out-patient care as well as in the public health domain.

The coursework includes fundamental concepts of therapeutic dietetics, applied physiology, clinical biochemistry, and applied nutrition in various fields and food service management in institutions. Mandatory and elective courses, along with their corresponding practical and extensive internships (On the Job training) form an integral part of the curriculum.

The papers in Research Methods and those in Statistics will help students to understand the techniques and methodologies used for evidence-based practice. The elective courses offer various training opportunities in the most recent advances in the field of dietetics, insight into entrepreneurship will enhance competencies in channelizing ideas and innovations related to dietetics and public health. Students will acquire competencies in developing a multidisciplinary approach to tackle chronic disease conditions. Emphasis has been placed in providing adequate theoretical and practical knowledge in intensive care nutrition therapy for acute and critical cases as well as emphasizing on detailed case studies in all other aspects of medical nutrition therapy. Successful completion of this P.G. Diploma programme will enhance employability of students, providing multiple avenues for their professional development in the field of dietetics.

This field lends itself to multiple entrepreneurial opportunities as diet and fitness consultants as well as in the public health sector. The training in use of digital technology is another path to impart nutrition education and to reach out to the masses as an integral part of public health.

Overall, the P.G. Diploma in Dietetics and Applied Nutrition will aim to deliver holistic education integrating the theory and practical learnings and will help students establish a niche career for themselves while contributing positively to society's health outcomes.

With the NEP 2020, it is time to meet the evolved need of this programme to metamorphose into an M.Sc. Programme. This extensive transfer of knowledge and skill is only possible with a two-year M.Sc. Programme with both classroom learning and intense industrial interactions in clinical dietetic settings. Emerging out of the prestigious 'College of Home Science Nirmala Niketan', affiliated to the premier University of Mumbai, dietitians with a M.Sc. qualification will be more competent in addressing dietetic concerns at both the national and global level as compared to the inputs received in a postgraduate diploma.

2) Aims and Objectives

a. To create a strong understanding of fundamental and advanced concepts in the field of Dietetics and Applied Nutrition.
b. To equip students with knowledge, skills and research competencies for professional application into the areas of food processing, therapeutic dietetics and public health nutrition.
c. To empower the students with analytical reasoning skills, research competencies; open mindedness to use recent technologies; creativity for contribution to individuals' and the community's health and an entrepreneurial bend of thought and action.
d. To create competent professionals who work with acknowledgement of the dynamism and evolution in the field of clinical nutrition and dietetics, and are capable of keeping up with the emerging trends and practices in the field with a vision to contribute to national development.

3) Programme/ Learning Outcomes

The programme encompasses a comprehensive range of skills and knowledge, values and mindset, enabling graduates to excel in the multifaceted field of Dietetics and Applied Nutrition. On successful completion of the programme, student will be able to be a competent and valuable member of the fraternity as outlined below:

Programme Outcome (PO)	Definition To be able to…	Graduate Attribute
PO1	Demonstrate an in-depth knowledge and understanding of core fundamentals of concepts of nutrition and therapeutic Dietetics, public health and management of food service in a hospital/health care setup.	Disciplinary Knowledge
PO2	Effectively develop nutritious and therapeutic diets and to communicate them clearly to patients, explaining complex concepts of nutrition in simple and understandable terms both orally and in writing.	Communication Skills

PO3	Design effective diets based on the nutritional diagnosis and evaluate the modes of nutritional therapies as per the individual requirements of the patient's clinical status.	Critical Thinking
PO4	Creatively construct Dietary and Nutritional strategies to manage diseases, and address nutrition related health issues in the clinical set up; to support the hospital / clinical industry as a knowledge partner in formulation of healthy food products; and to engage in entrepreneurial initiatives to solve individual and community health problems.	Innovation, Entrepreneurial
PO5	Competently evaluate traditional as well as recent nutrition practices in relation to evidence-based nutrition and draw applicable conclusions, using a scientific and an open mind with the vision of bettering food and nutrition practice in the clinical set up.	Analytical and Scientific Reasoning
PO6	Proficiently explore the cause-and-effect relationships of food, nutrition and lifestyles on health and to construct and follow through a research problem using research techniques and statistical analysis, thus drawing up adequate conclusions for applications of research in the clinical / hospital industry, community and clinical setups as employee or entrepreneur.	Research related skills
PO7	Successfully work in, cooperate and derive meaningful beneficial conclusions for food consumers' requirements as well as patients' and community health through interdisciplinary and collaborative efforts in the healthcare sector.	Cooperation /Team work
PO8	Envision a drive to translate research, recent innovations and personal and professional experiences into applications to benefit food industry, clinical management of disease, community health; and entrepreneurial ventures with self-awareness and introspection	Reflective Thinking
PO9	Use technology for nutrition and dietetic communications, consumer information, hospital administration, diet planning, nutrition education as well as be aware of using digitization for entrepreneurial ventures.	Information/digital literacy
PO10	Work independently, identify appropriate resources for a project and manage a project to completion.	Self – Directed Learning
PO11	Be adept with regard to national and global multi-cultural aspects of foods and nutrition, thus being able to deliver food products and nutrition and lifestyle strategies for health in harmony with the existing cultural practices of the individual and the community.	Multi-cultural competence
PO12	Practice principles of dietetics and community health in the most sustainable and effective manner, placing consumer, patient, community and fraternity well-being at the center of operations and refrain unethical behavior at workplace, the community and research.	Moral and Ethical awareness and reasoning

PO13	Take on leadership positions formulating and sharing an inspiring vision and the eagerness to bring productive and sustainable positive results for the professional group, the community and the foods, nutrition and dietetics fraternity using organizational, entrepreneurial and managerial skills.	Leadership readiness/qualities
PO14	Continue lifelong learning and be updated with cutting edge knowledge and practices in the field and the understanding that ongoing learning has to be the personal and professional way of life; thus, being continuously involved in evolving, up scaling, reinventing and reskilling to the requirements of the times.	Lifelong learning

4) Any other point (if any)

5) CREDIT STRUCTURE OF THE PROGRAMME (SEMESTER – I)
(Table as per Parishishta 1 with sign of HOD and Dean)

R_____

Postgraduate Programme in University:

A. P.G. Diploma in Home Science – Dietetics and Applied Nutrition

Parishishta – 1

Year (1 Yr PG)	Level	Sem. (1 Yr)	Major		RM	OJT/ FP	RP	Cum. Cr.	Degree
			Mandatory*	Electives (Any one)					
I	**6.0**	**Sem-I**	**Course 1** A) Human Physiology (Th) (2 Cr) B) Health & Nutrition Assessment (Pr) (2 Cr) **Course 2** Macronutrients in Human Health and Disease (Th) (4 Cr) **Course 3** A) Preventive Dietetics (Th) (2 Cr) B) Therapeutic Dietetics - I (Pr) (2 Cr) **Course 4** Descriptive Statistics in Home Science (Th) (2 Cr)	**Course 5 Elective 1** A) Applications of Food Science in Development of Therapeutic Foods (Th) (2 Cr) B) Applications of Food Science in Development of Therapeutic Foods (Pr) (2 Cr) **OR** **Elective 2** A) Multi-Disciplinary Strategies for Health and Disease Management (Th) (2 Cr) B) Multi-Disciplinary Strategies for Health and Disease Management (Pr) (2 Cr)	**Course 6** Research Methods in Home Science (4 Cr)	-	-	22	**PG Diploma (after 3 Year Degree)**
Sem – I (For PG Diploma)			**14**	**4**	**4**	**-**	**-**	**22**	

Note: Curriculum will be supplemented by Extension Work and Educational Trips for experiential learning with supplemental credits.

A MOOC course on SWAYAM/ NPTEL/COURSERA can be completed with supplemental credits.

CREDIT STRUCTURE OF THE PROGRAMME (SEMESTER – II)
(Table as per Parishishta 1 with sign of HOD and Dean)

R_____

Postgraduate Programme in University:

A. P.G. Diploma in Home Science – Dietetics and Applied Nutrition

Parishishta – 1

Exit option: P.G. Diploma (44 Credits) after Three Year UG Degree									
Year (1 Yr PG)	**Level**	**Sem.** (1 Yr)	**Major**		**RM**	**OJT/ FP**	**RP**	**Cum. Cr.**	**Degree**
			Mandatory*	**Electives (Any one)**					
I	**6.0**	**Sem-II**	**Course 1** Adult and Geriatric Nutrition (Th) (4 Cr) **Course 2** Micronutrients in Human Health and Disease (Th) (4 Cr) **Course 3** A) Clinical Nutrition and Therapeutic Dietetics (Th) (2 Cr) B) Therapeutic Dietetics - II (Pr) (2 Cr) **Course 4** Advanced Statistics in Home Science (2 Cr)	**Course 5 Elective 1** A) Entrepreneurship and Innovation in Clinical Nutrition (Th) (2 Cr) B) Entrepreneurship and Innovation in Clinical Nutrition (Pr) (2 Cr) **OR** **Elective 2** A) Digital technology in Dietetics (Th) (2 Cr) B) Digital technology in Dietetics (Pr) (2 Cr)	-	On the Job training (4 Cr)	-	22	**PG Diploma (after 3 Year Degree)**
Sem – II (For PG Diploma)			**14**	**4**	**-**	**4**	**-**	**22**	
Cum. Cr. For PG Diploma			**28**	**8**	**4**	**4**	**-**	**44**	

Note: Curriculum will be supplemented by Extension Work and Educational Trips for experiential learning with supplemental credits.

A MOOC course on SWAYAM/ NPTEL/COURSERA can be completed with supplemental credits.

Students are required to do a Summer Internship/Project (4 weeks) as a mandatory requirement during the summer vacation with supplemental credits.

Year & Level	Mandatory	Elective	RM	OJT/ FP	RP	Cum. Cr.	Degree
Cum. Cr. for 1 Yr. PG Degree	**28**	**8**	**4**	**4**	**-**	**44**	

Note: * The number of courses can vary for totaling 14 Credits for Major Mandatory Courses in a semester as illustrated.

Sign of Head of the Institute:

Sign of Dean:

Name of the Head of the Institute:
Dr. Anuradha J. Bakshi
(I/C Principal)

Name of the Dean:

Name of the Department:
Foods, Nutrition and Dietetics

Name of the Faculty:

Syllabus: P.G. Diploma in Home Science – Dietetics and Applied Nutrition

Semester I (_____) **Level: 6.0** **Cumulative Credits: 22**

Mandatory Courses (Credits 14)

Code: _____: Course 1 Credits 4 C1: A) Physiology and Clinical Biochemistry (Th) (2 Cr)
B) Health & Nutrition Assessment (Pr) (2 Cr)

Code: _____: Course 2 Credits 4 C2: Macronutrients in Human Health and Disease (Th) (4 Cr)

Code: _____: Course 3 Credits 4 C3: A) Preventive Dietetics (Th) (2 Cr)
B) Therapeutic Dietetics - I (Pr) (2 Cr)

Code: _____: Course 4 Credits 2 C4: Descriptive Statistics in Home Science (Th) (2 Cr)

Elective Courses: Course 5 (Credits 4)

Code: _____: A) Applications of Food Science in Development of Therapeutic Foods (Th) (2 Cr)
B**)** Applications of Food Science in Development of Therapeutic Foods (Pr) (2 Cr)

OR

Code: _____: A) Multi-Disciplinary Strategies for Health and Disease Management (Th) (2 Cr)
B**)** Multi-Disciplinary Strategies for Health and Disease Management (Pr) (2 Cr)

Research Methods: Course 6 (Credits 4)

Code: _____: Research Methods in Home Science (Th) (4 Cr)

Syllabus:

P.G. Diploma in Home Science – Dietetics and Applied Nutrition

(Semester I)

Semester-I

Semester-I: Mandatory Courses

P.G. Diploma in Home Science – Dietetics and Applied Nutrition
Level – 6.0
(Under NEP)

Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 1 A	**Human Physiology**	**Theory**	**2**

Course Objectives:

1. To help students strengthen their understanding of the fundamental concepts of physiological processes of the human body.
2. To facilitate comprehension of newer and applied concepts of human physiology.
3. To enable in students the skills of application of the principles of physiology in health and disease management.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recognize major physiological systems and metabolic processes and their interconnections.
CO2	Explain the principles underlying physiological processes and biochemical reactions.
CO3	Apply knowledge of physiological mechanisms and biochemical parameters to analyze real-world clinical scenarios.
CO4	Analyze clinical biomarkers to assess health conditions and disease progression.
CO5	Construct informed opinions on emerging trends and controversies in physiological and clinical biochemical research.
CO6	Develop comprehensive strategies for diagnosing complex medical cases through nutritional interventions.

Unit No.	Course Content	No. of Hours
I.	**A. Cellular levels of organization:** i Plasma membrane, Organelles, Cell life cycle; Tissue level of organization: types of tissues, structure and function **B. Nervous and Sensory System:** i Introduction to central and autonomic nervous system, ii Structure of neuron, fundamental principles of nervous control, reflex actions iii Overview of neurological disorders: Alzheimer's and Parkinson s disease **C. Digestive System**: i Overview of structure and function: Oral cavity, Stomach, Intestine, Pancreas, Liver, Gallbladder ii Process of digestion and absorption	**15**

	iii Pathophysiology of disorders related to Upper and lower GI tract, liver, pancreas and gallbladder **D. Endocrine system:** i Location of different glands (Pituitary, thyroid, parathyroid, adrenal, gastro-intestinal, pancreas, adipose), their secretions ii Functions of the different hormones and disorders **E. Reproductive system:** i Structure and function of the male and female reproductive system ii Physiology of menstruation, pregnancy and lactation iii Biochemical tests: Reproductive Hormones and infertility and PCOS **F. Lymphatic system and Immunity**: i Functions; Lymphatic vessels, lymphocytes, Lymphoid tissues and organs; Types of immunity (Non-specific and Specific); Innate immune system; Immune response ii Hyper-sensitivities and allergies	
II.	**A. Cardiovascular system**: i Blood components and function of blood (serum/plasma difference) ii Blood related disorders (sickle cell anemia & thalassemia) iii Heart and the circulatory system: Structure of heart, Cardiac cycle, Conducting system of the heart, Blood circulation (Structure of vessel wall, Arteries, veins and capillaries, Blood pressure Peripheral resistance, Pulmonary circuit and systemic circuit) iv Cardiovascular disorders- Hypertension and hyperlipidemia, **B. Respiratory System:** i Parts of the respiratory system (Upper and lower respiratory system) ii Structure of lungs, External and internal respiration pulmonary ventilation iii Acid Base balance iv Pulmonary disorders- COPD and cystic fibrosis, pneumonia and tuberculosis **C. Excretory System:** i Structure and function of: Kidney and nephrons, mechanism of urine formation ii Fluid and electrolyte balance iii Renal disorders **D. Musculo-Skeletal System:** i Structure and classification of bones Axial and Appendicular skeletal structure, voluntary and involuntary muscles ii Physiology of contraction and relaxation of muscles iii Musculoskeletal disorders **E. Inherited metabolic disorders:** i Modes of inheritance, ii Disorders related to carbohydrate, protein, fat, vitamin, mineral and nucleic acid metabolism	**15**
	Total hours	**30**

References:

Guyton, A.C. (2020). Textbook of Medical Physiology 14th Edition., Saunders Company.
Best and Taylor, (1975) The living Body. Chapman and Hall Ltd., London.
Chatterjee, C.C (2007). Human Physiology. Medical Allied Agency, India.
Pal, G., Pal, P., Nanda, N. (2016). Comprehensive Textbook of Medical Physiology - Two Volume Set. India: Jaypee Brothers Medical Publishers Pvt. Limited.

Tortora, G. J., Derrickson, B. H. (2017). Tortora's Principles of Anatomy and Physiology. Singapore: Wiley.
Ross and Wilson (2010). Anatomy and Physiology in health and illness. 10th ed, Elsevier, China
Waugh, A., Grant, A. (2018). Ross & Wilson Anatomy and Physiology in Health and Illness. United Kingdom: Elsevier Health Sciences.

Evaluation:
2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
PowerPoint presentation/ Literature review with class discussion	10
Swayam/ MOOC with completion certificate/ Development of learning resources (videos/ posters/ brochures) for nursing or dietetic students	10
Class tests	5
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

P.G. Diploma in Home Science – Dietetics and Applied Nutrition
Level – 6.0
(Under NEP)

Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 1B	**Health and Nutrition Assessment**	**Practical**	**2**

Course Objectives:

1. To develop within the students an understanding and appreciation of the need for nutrition assessment.
2. To enable students to assess nutritional status in a clinical setting and familiarize students with different approaches in clinical nutrition assessment.
3. To help students understand the process of monitoring nutritional status.
4. To orient the students in assessment of the appropriateness of assessment methods for specific populations or health goals.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recall and identify key components of health and nutrition assessment protocols.
CO2	Interpret the significance of various assessment parameters in evaluating health and nutritional status.
CO3	Demonstrate the ability to use various nutritional assessment tools to estimate nutrient intake.
CO4	Compare and contrast assessment results with established reference standards.
CO5	Evaluate potential limitations and sources of error in health and nutrition assessment methods.
CO6	Assess the appropriateness of assessment methods for specific populations or health goals.

Unit No.	Course Content	No. of Hours
I.	**A. Introduction to concepts used in nutritional assessments** **B. Demonstration of direct methods to assess nutritional status** i Assessment of Nutritional status: • Anthropometry, Body Composition assessment (various methods - direct and indirect), BIA, Growth monitoring for children • Biochemical assessment (Practical aspects)- Need for Biochemical tests, Types of Biochemical markers, Nutrient specific biochemical markers, Interpretation of Biochemical markers, Limitations of biochemical assessments, Interpretations of the result, comparisons with the standards, suggestions/ recommendations	**30**

	• Clinical signs and symptoms: Disease specific clinical signs & symptoms Clinical signs of nutritional deficiencies • Dietary assessment of nutrition status: Types of dietary assessment techniques: FFQ, 24-Hour Dietary Recalls, Food Diaries or Food Records, Dietary History, Diet Quality Indices, Photographic Food Records, Food Frequency Cards, Dietary Interviews; Analysis & interpretation of data, Problems in diet surveys and solutions **C. Development of nutrition assessment tools: formulation of nutrition assessment questionnaire** **D. Exposure to recent and advanced techniques for specific nutrient status assessment** i Online tools or software that estimate nutrient intake based on food consumption data ii Digital Food and Nutrition Apps iii Remote Sensing Technologies	
II	**Practical aspects of tests used in biochemical assessment** i Need, indications for use, limitations and interpretations of the following tests and development of biochemical assessment protocols with respect to the following tests: • Tests of gastro intestinal function: Gastric Functions tests, Blood glucose levels, urine and stool examination, enzyme tests • Tests for hormone levels • Tests for reproductive hormones • Tests for cardiovascular function: Lipid Profile, stool examination, enzyme tests, inflammatory markers, cardiac biomarkers, electrocardiogram (ECG/EKG), Echocardiogram, Stress Test, Coronary Angiography • Tests for Lung Function • Renal function tests (blood and urine), enzyme tests • Serological tests and tests for allergies • Biochemical tests for muscle and bone (enzyme like ALP, CK and blood tests like calcium, magnesium, phosphate, 25-Hydroxyvitamin D, uric acid, vitamin B12, folate, iron and ferritin) and DEXA • Biomarkers for neurological disorders: Amyloid Beta (Aβ) and Tau Proteins, Cerebrospinal fluid, Dopamine • Tumour markers and Cancer diagnostics • Tests for inborn errors of metabolism	**30**
	Total hours	**60**

References:

Charney, P., & Malone, A. (2017). Nutritional Assessment. Lippincott Williams & Wilkins.

Gibson, R. S. (2016). Nutrition Assessment: A Comprehensive Guide for Planning Intervention. Oxford University Press.

Gibson, R., & Leroy, B. (Eds.). (2016). Assessment of Nutritional Status. Oxford University Press.

Gropper, S. S., Smith, J. L., & Carr, T. P. (2017). Advanced Nutrition and Human Metabolism.

Cengage Learning.
Koh-Banerjee, P., & Bray, G. A. (2008). Assessment of Nutrient Intakes. CRC Press.
Lee, R. D., Nieman, D. C., & Young, J. C. (2019). Nutrition Assessment. McGraw-Hill Education.
Mahan, L. K., & Raymond, J. L. (2016). Krause's Food & the Nutrition Care Process. Elsevier.
Ross, A. C., Caballero, B., & Cousins, R. J. (2019). Modern Nutrition in Health and Disease. Lippincott Williams & Wilkins.
Webb, G. P., & Worsley, A. (2019). Clinical Nutrition: A Functional Approach. Oxford University Press.
Willett, W. (2012). Nutritional Epidemiology. Oxford University Press.

Evaluation:
2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Journal	5
Development of summary documents on interpretation of nutrient specific biochemical test as resource material for healthcare professionals	10
Construction of a dietary assessment questionnaire	10
Total	**25**

Semester-end Examination:	**Marks**
Construction of case specific assessment protocol and viva-voce examination	25
Total	**25**

P.G. Diploma in Home Science – Dietetics and Applied Nutrition
Level – 6.0
(Under NEP)

Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 2	**Macronutrients in Human Health and Disease**	**Theory**	**4**

Course Objectives:

1. To enable students to get an insight into the role of Nutrition in growth and development.
2. To help students understand the importance of nutrition in maintaining optimal body composition.
3. To update students on the recent advances in Human Nutrition with respect to macronutrients.
4. To guide students to evaluate the impact of different macronutrients on wellness.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recall and remember the three primary macronutrients: carbohydrates, proteins, and fats.
CO2	Summarize the metabolic processes involved in the digestion and absorption of macronutrients.
CO3	Interpret the relationship between macronutrient intake and energy balance.
CO4	Utilize information about macronutrients to make informed dietary choices.
CO5	Analyze the effects of different types of macronutrients on health and disease management.
CO6	Compare and contrast various macronutrients in terms of their nutritional benefit.
CO7	Evaluate the impact of different macronutrients on wellness.

Unit No.	Course Content	No. of Hours
I.	**A. Human Body composition:** i Models of body composition ii Changes in body composition through life cycle and factors influencing it iii Methods of measuring body composition in hospitalized patients iv Effect of various clinical conditions and disease on body composition **B. Concept of dietary nutrient recommendations**: i EAR, RDAs, DRI, TUL etc ii Nutrient requirements for different age groups and basis for deriving energy and nutrient requirements **C. The effect of nutrients on epigenetics and its role in mental and**	**15**

	physical development	
II.	**A. Energy:** i Units of energy ii Energy intake vs Energy expenditure (EE) iii Components of EE iv Estimation of BMR & Total Energy expenditure- Calorimetry (Direct & Indirect) and Non-calorimetric techniques v GEV & MEV vi Atwater Factors-Advantages & Disadvantages vii Energy Imbalances-Excess & Deficiency –Acute and Chronic viii Physiological adaptations to over and under nutrition ix Recent advances in energy regulation with respect to gut microbiota, circadian rhythm, sleep and innovative techniques in energy expenditure measurements **B. Carbohydrates:** i Overview of Classification ii Functions, digestion and absorption iii Recent advances in, • Carbohydrate recommendations • Glycemic Index and Glycemic Load-Applications in the diet • Dietary fiber, Prebiotics • Resistant Starch-Types, Health benefits • Sugar Substitutes-Nutritive and non -nutritive sweeteners- Synthetic and Natural sweeteners • Carbohydrate and Gut health	**15**
III.	**A. Proteins and Amino acids**: i Overview of Classification, Functions, digestion and absorption ii Essential Amino acid requirements and AA imbalances iii Assessment of quality of Food Protein-Biological and chemical methods iv Assessment of protein nutritional status: Anthropometry, BIA, Tracer techniques v Recent advances in, • Plant-Based proteins • Protein distribution and timing • Protein and Gut health	**15**
IV.	**A. Fats and Fatty acids**: i Overview of Classification, Functions, digestion and absorption ii Recent advances in, • Requirements of total dietary fat and fatty acid consumption; Fatty acid ratios • Role of different fat glycerides (MCTs, LCTs), total fat intake, SFA, MUFA & PUFAs in health & disease • Oil blends and fat substitutes • Fat and Gut health	**15**
	Total hours	**60**

References:

Craig, W. J., & Prentice, A. M. (2002). Nutrition and Dietetics: A Manual for Students of Medicine, Dentistry, Nursing, Public Health, and for Qualified Practitioners. Churchill Livingstone.

Gropper, S. S., Smith, J. L., & Carr, T. P. (2017). Advanced Nutrition and Human Metabolism. Cengage Learning.

Lanham-New, S. A., Macdonald, I. A., & Roche, H. M. (Eds.). (2012). Nutrition and Metabolism. Wiley.

McGuire, M., & Beerman, K. A. (2018). Nutritional Sciences: From Fundamentals to Food. Cengage Learning.

Shils, M. E., Olson, J. A., Shike, M., & Ross, C. A. (Eds.). (2006). Modern Nutrition in Health and Disease (10th ed.). Lippincott Williams & Wilkins.

Sizer, F., & Whitney, E. (2020). Nutrition: Concepts and Controversies. Cengage Learning.

Sohi, Darshan. (2019). A Comprehensive Textbook of Nutrition & Therapeutic Diets. Jaypee Brothers Medical Publishers.

Srilakshmi, B. (2012). Human Nutrition. New Age International (P) Limited, Publishers.

Stephenson, T., & Schiff, W. (2021). Human Nutrition: Science for Healthy Living. McGraw-Hill Education.

Stipanuk, M. H., & Caudill, M. A. (2018). Biochemical, Physiological, and Molecular Aspects of Human Nutrition. Elsevier.

Taylor, S. L. (Ed.). (1999). Advances in Food and Nutrition Research. Academic Press.

Whitney, E., & Rolfes, S. R. (2022). Understanding Nutrition. Cengage Learning.

Wildman, R. E. C. (2016). Advanced Human Nutrition. CRC Press.

Evaluation:

4 credits (Total marks 100)

Continuous Internal Evaluation:	**Marks**
PowerPoint presentation/ Literature review with class discussion	20
Critical analysis/ Literature review/Preparation of learning resources (videos/ posters/ brochures) for nursing or dietetic students	20
Class test/ Quiz/ Debate	10
Total	**50**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from Unit 3	10
Question 4 from Unit 4	10
Question 5 from multiple units	10
Total	**50**

P.G. Diploma in Home Science – Dietetics and Applied Nutrition
Level – 6.0
(Under NEP)

Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 3A	**Preventive Dietetics**	**Theory**	**2**

Course Objectives:
To help students:

1. Gain a deep understanding of preventive measures and their significance in minimizing disease burden.
2. Understand the etiological factors and physiological changes associated with specific disease conditions and develop an insight into the role of modified diets in specific conditions.
3. Acquire the basic skills required to modify the normal diet to suit individuals suffering from specific diseases and lifestyle disorders.
4. Apply concepts of preventive dietetics in community/ clinical settings.

Course Outcomes (CO):
On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	List key lifestyle factors that contribute to the development of preventable diseases.
CO2	Interpret the importance of early detection and intervention in preventing disease progression.
CO3	Utilize screening guidelines to recommend appropriate preventive measures based on individual characteristics.
CO4	Compare and contrast the effectiveness of different preventive strategies for specific diseases.
CO5	Design comprehensive preventive health strategies for specific target populations.
CO6	Design and organize the therapeutic diet according to the nutrition care process

Unit No.	Course Content	No. of Hours
I.	**A. Nutritional Care Process and Counseling Strategies:** i The Nutrition Care process: a detailed study of nutritional assessment, diagnosis, planning and goal setting, intervention, follow-up and documentation ii Role and skills of a Dietitian iii Modifications of the Normal Diet iv Hospital inpatient nutritional care v Relevance of research for a Nutritionist/Dietitian vi Detailed study of Nutrition Counseling theories and strategies **B. A Weight Management** **i Obesity and overweight** • Genetic regulation of body weight • Etiology, pathophysiology, classification, causes and assessment techniques, metabolic effects of obesity with special reference to obesity as an inflammatory disease • Management strategies for prevention: Nutritional and dietary management, exercise, lifestyle and behavioral changes • Management of obesity in pregnancy, lactation and childhood **ii Underweight and eating disorders** • Underweight: Etiology, metabolic consequences of starvation and management strategies • Eating Disorders: Anorexia Nervosa, Bulimia Nervosa, Binge eating disorder, eating disorder not otherwise specified • Nutritional deficiencies in underweight and managing comorbidities	15
II.	**A. Type 2 Diabetes Mellitus** i Etiology, pathophysiology, assessment and complications (Acute and chronic) ii Dysbiosis of gut and its relation with onset of diabetes mellitus Medical (OHA and insulin), nutritional and lifestyle management strategies iii Nutrition in exercising diabetic populations **B. Cardiovascular Diseases** i Atherosclerosis and arteriosclerosis • Etiology, risk factors, diagnosis, pathophysiology and progression, endothelial dysfunction • Consequences of atherosclerosis: Arterial blockage, Thrombus formation and occlusion, embolism, inflammation • Etiology, Pathophysiology, Diagnosis, assessment and management strategies for prevention (Nutritional Lifestyle) of: ii Hypertension iii Hyperlipidemias iv Angina Pectoris **C. Metabolic Syndrome** • Prevalence, etiology, risk factors, complications and management • Preventive strategies • Prevention of PCOS **D. Nutrition in Prevention of Neurological Decline** (Impaired Cognitive function, Senility/Dementia) i Reducing the risk for neurodegenerative diseases (Alzheimer's and Parkinson's disease)	15

	ii Prevention of depression **E. Nutrition for prevention of decline in bone health** i Vitamin D deficiency ii Osteomalacia iii Osteoporosis **F. Nutrition in Cancer prevention** **G. Prevention of Nutritional Anaemias**	
	Total hours	**30**

References:

Barrer. K. (2007) Basic Nutrition Counselling Skill Development. Wadsworth Pub

Bendich, A., & Deckelbaum, R. J. (Eds.). (2006). Preventive Nutrition: The Comprehensive Guide for Health Professionals. Springer.

Bendich, A., & Deckelbaum, R. J. (Eds.). (2016). Preventive Nutrition: The Comprehensive Guide for Health Professionals. Humana Press.

Blake, J. S. (2018). Nutrition: From Science to You. Pearson.

Blake, J. S. (2020). Nutrition and You: Core Concepts for Good Health. Pearson.

Brown, J. E. (2019). Nutrition Through the Life Cycle. Cengage Learning.

Lutz, C. A., Przytulski, K. R., & Rutherford, K. L. (2015). Nutrition and Diet Therapy. F.A. Davis Company.

Mahan, L. K., & Raymond, J. L. (2021). Krause's Food & the Nutrition Care Process. 15th edition. Elsevier.

Pope, J., & Berman, M. (2017). Nutrition for a Changing World. Wadsworth Publishing.

Shills. M. (2006). Modern Nutrition in Health and Disease.10th ed. Lippincot William and Wilkins.

Sizer, F., & Whitney, E. (2020). Nutrition: Concepts and Controversies. Cengage Learning.

Smolin, L. A., & Grosvenor, M. B. (2018). Nutrition: Science and Applications. Wiley.

Evaluation:

2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Create a brand (website/ logo), create a nutrition care process model and use social media for nutrition education/ Design a preventive module for community on a chosen topic using oral, written and social media communication	10
Developing a nutrition education resources on preventive health for nurses/ doctors/ dietitians	10
Quiz/ Debate/ Class discussion/ Debate	5
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from from multiple units	5
Total	**25**

P.G. Diploma in Home Science – Dietetics and Applied Nutrition
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Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 3B	**Therapeutic Dietetics I**	**Practical**	**2**

Course Objectives:

1. To provide a detailed practical aspect to the clinical conditions studied in theory.
2. To enable students to:
   - Do a detailed study of Medical Nutrition Therapy with appropriate literature review.
   - Analyze the given case.
   - Make a nutritional diagnosis with problem, etiology and symptom (PES) Statement and outline the goals of therapy.
   - Study of medical and surgical interventions which require nutritional management.
   - Propose a nutrition plan for the patient – with suggested outline of medical nutrition therapy with appropriate literature review, diet plan with detailed calculations and suggested supplements and adjuncts.
   - Prepare the selected meal.
   - Evaluate the suggested diet plans.
   - Prepare patient education resources.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recall key principles of therapeutic dietetics and their application in clinical settings.
CO2	Explain the rationale behind different therapeutic diets and their effects on health.
CO3	Apply knowledge of dietary modifications to create personalized meal plans for different medical conditions.
CO4	Demonstrate the ability to calculate nutrient content in therapeutic diets.
CO5	Compare and contrast various dietary approaches for managing similar health conditions.
CO6	Judge the suitability of therapeutic diets for patients with comorbidities or special dietary requirements.
CO7	Design comprehensive dietary plans that integrate therapeutic requirements, patient preferences, and cultural considerations.

Unit No.	Course Content	No. of Hours
I.	**A. Understanding the role of supplements and nutraceuticals (Review)** **B. Planning of Diets:** i Planning diets using Medical Nutrition Therapy with allocation of proximate principle ii Menu Planning iii Detailed calculation to understand the efficacy of the plan iv Supplement usage v Outline recommendations in easily understood format vi Planning for the following conditions: • Obesity and Metabolic syndrome: Juvenile Onset and Adult-Onset obesity, Bariatric Surgery, VLCD, PCOD • Eating Disorders • Diabetes: Pre-diabetes, Type II DM **C. Preparation of the prescribed therapeutic food samples with respect to the above cases**	**30**
	A. Planning of Diets: i Planning diets using Medical Nutrition Therapy with allocation of proximate principle ii Menu Planning iii Detailed calculation to understand the efficacy of the plan iv Supplement usage v Outline recommendations in easily understood format vi Planning for the following conditions: • Cardiovascular Diseases: Atherosclerosis, Hyperlipidemias, Hypertension, metabolic syndrome • Bone Health: Osteoporosis, Osteomalacia • Prevention of cancer and overview of neutropenic diet • Nutritional Anaemias • Prevention of Neurodegeneration **B. Preparation of the prescribed therapeutic food samples with respect to the above cases**	**30**
	Total hours	**60**

References:

Brown, J. (2002). Nutrition through the Lifecycle. Wadsworth Pub Co.

Garrow, J.S (1993). Human Nutrition and Dietetics 9th ed. Churchill Livingstone Pub.

Gibney, J.M. (2005). Clinical Nutrition Blackwell Publishing House.

Gopalan.C. (2000). Nutritive Value of Indian Foods. NIN ICMR Pub.

Jamison, J. (2003). Clinical Guide to Nutrition and Dietary Supplements in Disease Management Churchill – Livingstone Pub.

Jeejeebhoy, et al (1988). Nutrition and Metabolism in Patient Care.

King, K. (2003). Nutrition Therapy 2nd ed. Helm Publishing, Texas.

Kathryn Pinna (Author), Sharon Rady Rolfes, Ellie Whitney: Understanding Normal and Clinical Nutrition, 12th Edition. (2020), Brooks/Cole publishers.

L. Kathleen Mahan: Krause's Food & the Nutrition Care Process, 14th Edition, (2017), Saunders Publishers.

Peckenpaugh, N (2003). Nutrition Essentials and Diet Therapy. 9th ed.
Sauberlich. H (1999) Laboratory Tests for the Assessment of Nutritional Status 2nd ed. CRC Press.
Saunders Pub Co. Blackwell Scientific Publication (1994). Manual of Dietetic Practice.2nd ed.
Shills, M. (2006). Modern Nutrition in Health and Disease.10th ed.Lippincot.
W.B.Saunders CO. Lee, R.D. (2003). Nutritional Assessment 3rd ed. Mc Graw Hill Pub.
Whitney.C. (2006) Understanding Normal and Clinical Nutrition. Wadsworth publication.
William and Wilkins ICMR Pub. (2000). Nutrient Requirement and Recommended Dietary Allowances for Indians.

Evaluation:
2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	20
Total	**25**

Semester-end Examination:	**Marks**
Construction of a case specific diet plan	20
Viva Voce examination	5
Total	**25**

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Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 4	**Descriptive Statistics in Home Science**	**Theory**	**2**

Course Objectives:
1. To help students value the sine qua non role of statistics in quantitative research.
2. To enable in students the skills in selecting, computing, interpreting and reporting descriptive statistics.
3. To facilitate comprehension of elementary concepts in probability.
4. To introduce students to a specialised statistical software such as SPSS.

Course Outcomes (CO):
On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Identify the level of measurement of a variable and the corresponding suitable statistical technique to describe this variable.
CO2	Identify, differentiate between, evaluate, and select different descriptive statistical techniques to numerically summarise data.
CO3	Identify, differentiate between, evaluate, and select different descriptive statistical techniques to graphically summarise data.
CO4	Students will have the necessary knowledge and skills to design and conduct descriptive research studies.
CO5	Use SPSS for data entry, data management, and descriptive statistics effectively.

Unit No.	Course Content	No. of Hours
I.	**A. Introduction and overview to statistics** i Role of statistics in (quantitative) research ii Definition/changing conceptions iii Prerequisite concepts in mathematics (e.g., basic algebra, properties of the summation sign) **B. Descriptive Statistics for summarizing ratio level variables** i Frequencies and percentages ii Computing an average/measure of a central tendency • Mean, median, mode(s) • Contrasting the mean vs median • Computing an average when there are outliers or extreme values in • the data set • Robust measures of the center (5% trimmed mean; M estimators) • Quartiles and percentiles	**15**

	iii Computing a measure of variability or dispersion • Why? (Inadequacy of the mean) • Minimum value and maximum value • Range • Interquartile range • Variance and standard deviation iv Discrete and continuous variables v Histograms and line graphs	
II.	**A. Descriptive Statistics for summarizing nominal, ordinal and interval level variables** **B. Using specialized software such as SPSS** i Data Entry ii Data Management iii Descriptive Statistics **C. Probability** i Definition ii Role of probability in research and statistics iii Elementary concepts in probability • Sample space, experiment, event/outcome/element of the sample • space • Equally likely outcomes and the uniform probability model • Stabilization of the relative frequency	**15**
	Total hours	**30**

References:

Bhattacharyya, G.K., & Johnson, R.A. (1977). Statistical concepts and methods. John Wiley. (classic)

Jackson, S. L. (2012). Research methods and statistics: A critical thinking approach (4th ed.). Wadsworth Cengage Learning.

Johnson, R. A., & Bhattacharyya, G. K. (2019). Statistics: Principles and methods (8th ed.). John Wiley.

Martin, W. E., & Bridgmon, K. D. (2012). Quantitative and statistical research methods. Jossey-Bass.

Kachigan, S. K. (1986). Statistical analysis: An interdisciplinary introduction to univariate & multivariate methods. Radius Pr.

Kerlinger, F. N. & Lee, H. B. (2000). Foundations of behavioral research. Harcourt.

Wheelan, C. J. (2014). Naked statistics: Stripping the dread from the data. W.W. Norton.

Evaluation:

2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Written Short Quizzes	10
SPSS data entry & descriptive statistical analysis assignment	5
Problem-solving Exercises (in pairs or individually) & Practice Sums (individually)	10
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Semester-I:
Elective Courses

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Semester- I **Major (Elective Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 5 Elective 1: A	**Applications of Food Science in Development of Therapeutic Foods**	**Theory**	**2**

Course Objectives:
To enable students:

1. Understand key principles of food science and the role of bioactive compounds in health.
2. Apply techniques of preservation methods to preserve nutrients, ensure safety in therapeutic food production.
3. Grasp ethical, regulatory aspects, explore emerging technologies for personalized therapeutic foods.

Course Outcomes (CO):
On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recall fundamental concepts of food science and their relevance in therapeutic food development.
CO2	Explain the principles of bioactive compounds and their role in therapeutic foods.
CO3	Interpret the connection between food processing techniques and nutrient retention in therapeutic foods.
CO4	Utilize scientific understanding to address challenges in developing palatable and effective therapeutic foods.
CO5	Compare and contrast the nutritional content and functional attributes of various therapeutic food products.
CO6	Evaluate the impact of processing methods on the nutritional quality and safety of therapeutic foods.
CO7	Judge the appropriateness of different food processing techniques in creating therapeutic products.

Unit No.	Course Content	No. of Hours
I.	**A. Introduction to Therapeutic Foods** i Definition and scope of therapeutic foods ii Importance of food science in addressing nutritional challenges **B. Bioactive Compounds and Functional Foods** i Overview of bioactive compounds and their health benefits ii Exploration of vitamins, minerals, phytochemicals, and their roles in health	**15**

	iii Functional foods and their impact on disease prevention and management iv Importance of Probiotics, Prebiotics **C. Food Preservation Techniques for Nutrient Retention** i Preservation methods: drying, freezing, fermentation ii Minimizing nutrient loss during food processing	
II.	**A. Sensory Evaluation and Safety of Therapeutic Foods** i Sensory attributes and consumer acceptance of therapeutic foods ii Ensuring food safety and quality in therapeutic food production **B. Ethical and Regulatory Considerations** i Ethical challenges in marketing and labeling therapeutic foods ii Regulatory frameworks and guidelines for therapeutic food development **C. Future Trends in Therapeutic Food Science** i Emerging technologies in food science and their potential impact ii Innovations in personalized nutrition and its application in therapeutic foods	**15**
	Total hours	**30**

References:

Amerine, Pangborn & Roessler (1965). Principles of Sensory Evaluation of food, Academic Press, London.

deMan J. (2007). Principles of Food Chemistry, 3rd ed., Springer.

Jameson K. (1998). Food Science – A Laboratory Manual, NewJersey:Prentice Hall Inc. Lawless, H. and Heymann, H.

McWilliam, M. (2001). Foods – Experimental Perspectives (4th Ed.), New Jersey: Prentice Hall Inc.USA: CRC Press Inc.

Meilgard (1999). Sensory Evaluation Techniques, 3rd ed. CRC Press LLC, 1999.

Pomeranz Y and Meloan CE (2002). Food Analysis – Theory and Practice, CBS Publishers and Distributors, New Delhi.

Rao E. S. (2013). Food Quality Evaluation. Variety Books.

Sensory Evaluation of Food – Principles and Practices, Kluwer Academic/Plemer Publishers.

Weaver, C. (1996), Food Chemistry Laboratory – A manual for Experimental Foods.

Evaluation:

2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
PowerPoint Presentation/ Literature review with class discussion	15
Critical analysis/ Literature review/Preparation of learning resources (videos/ posters/ brochures) for nursing or dietetic student/ Group discussion/ Quiz/ Class Test	10
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	10
Total	**25**

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Semester- I **Major (Elective Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 5 Elective 1: B	**Applications of Food Science in Development of Therapeutic Foods**	**Practical**	**2**

Course Objectives:
To help students:

1. Understand the application of principles of food science in the development of innovative therapeutic products.
2. Gain knowledge on the use functional foods, novel (less utilized) ingredients in development of products.
3. Develop skills in identifing a suitable packaging label and storage conditions for a developed product.
4. Gain knowledge on principles of sensory evaluation and its application.

Course Outcomes (CO):
On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Recall the fundamental steps involved in developing therapeutic foods.
CO2	Explain the role of different ingredients in enhancing the nutritional value of therapeutic foods.
CO3	Apply food processing techniques to create therapeutic food prototypes.
CO4	Demonstrate the ability to incorporate bioactive compounds into food products effectively.
CO5	Utilize sensory evaluation methods to assess the palatability of therapeutic foods.
CO6	Evaluate the sensory attributes and overall quality of developed therapeutic food products.
CO7	Analyze the impact of processing methods on the preservation of bioactive compounds.
CO8	Design innovative therapeutic food products that cater to specific health goals.

Unit No.	Course Content	No. of Hours
I.	**A. Sensory evaluation of foods** i Threshold concentrations of primary tastes ii Effect of Temperature on taste iii Identification of samples through Difference, Descriptive and Affective testing	**30**

	iv Describing sensory attributes requiring modification in various clinical conditions **B. Generation of idea and evaluation of sensory quality** i Concept development and testing based on market research ii Product development iii Determination of sensory evaluation methods for evaluating quality iv Developing scorecard as an evaluation tool	
II.	**A. Food Product Formulation addressing health concern** Enhancement of nutritive value, waste utilization, cost effectiveness, value addition of anyone of the product categories – Yoghurt, Beverage, Salad dressing, Low fat/low calorie/high fibre products, Desserts using artificial/low calorie sweeteners, Low sodium, low fat and high fibre products containing functional foods OR any other relevant product **B. Identifying suitable packaging material and designing nutrition labels**	**30**
	Total hours	**60**

References:

Amerine, Pangborn & Roessler (1965). Principles of Sensory Evaluation of food, Academic Press, London.

deMan J. (2007). Principles of Food Chemistry, 3rd ed., Springer.

Jameson K. (1998). Food Science – A Laboratory Manual, NewJersey:Prentice Hall Inc. Lawless, H. and Heymann, H. (1998).

McWilliam, M. (2001). Foods – Experimental Perspectives (4th Ed.), New Jersey: Prentice Hall Inc.USA: CRC Press Inc.

Meilgard (1999). Sensory Evaluation Techniques, 3rd ed. CRC Press LLC, 1999.

Pomeranz Y and Meloan CE (2002). Food Analysis – Theory and Practice, CBS Publishers and Distributors, New Delhi.

Rao E. S. (2013). Food Quality Evaluation. Variety Books.

Sensory Evaluation of Food – Principles and Practices, Kluwer Academic/Plemer Publishers.

Weaver, C. (1996), Food Chemistry Laboratory – A manual for Experimental Foods.

Evaluation:

2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Journal	5
Development of a new food product in groups (Writing the research proposal for development new product, standardization, packaging, labeling, marketing and sales)	20
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 Applications of food science from Unit 1	10
Question 2 Plan an experiment from Unit 2	10
Question 3: Viva-voce examination	5
Total	**25**

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Semester- I **Major (Elective Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 5 Elective 2: A	**Multidisciplinary Approaches to Health and Disease Management**	**Theory**	**2**

Course Objectives:

1. To help students understand the principles of multidisciplinary strategies in preserving health and combating disease.
2. To build competencies in students to apply the use of multidisciplinary strategies in health preservation and as adjuncts in disease management.

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Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Outline the various alternative strategies for preserving health and for disease management.
CO2	Understand the various interactions between traditional therapy and alternative strategies.
CO3	Apply the concepts of healing and health preservation by alternative strategies to individual and community patient care.
CO4	Analyze the application possibilities of alternative strategies to disease management.
CO5	Evaluate and comprehend the short term and long-term effects and compliance with respect to alternative strategies as well as to be able to recommend suitable strategies for patient care.
CO6	Design seminars, workshops and education materials to empower practitioners/patients with information on alternative strategies for health and disease and its potential.

Unit No.	Course Content	No. of Hours
I.	**A. Planning and organizing information sessions and developing nutrition education resources with respect to Alternative Strategies to preserve health and combat diseases with lifestyle-based etiologies:** i Mindfulness and Intuitive Eating ii Yoga iii Physical Activity Therapy – Dance therapy, Martial Arts, Exercise Therapy iv Matching Circadian Rhythm v Ayurveda vi Hypnotherapy vii Naturopathy viii Any Other	**15**
II.	**B. Planning and organizing information sessions and developing**	**15**

	nutrition education resources with respect to Alternative Strategies to preserve emotional and mental well-being and for pain management: i Meditation ii Energy healing iii Laughter therapy iv Acupuncture / acupressure v Massage Therapy vi Neuro Linguistic Programming vii Art Based Therapy viii Visualization ix Journaling and Reflection x Social support for Well being xi Any Other	
	Total hours	**30**

References:

Alman, B. M., Lambrou, P. (2013). Self-Hypnosis: The Complete Manual for Health and Self-Change, Second Edition. United Kingdom: Taylor & Fran

Angleo, J. (2016). Spiritual Healing: Energy Medicine for Health & Well-being. United Kingdom: Pavilion Books.

Art Therapy and Health Care. (2012). United States: Guilford Publications.

Ayurveda: A Preventive Approach to Lifestyle Diseases. (2023). (n.p.): Book Bazooka Publication.

Bays, J. C. (2017). Mindful Eating: A Guide to Rediscovering a Healthy and Joyful Relationship with Food (Revised Edition). United Kingdom: Shambhala.

Church, D. (2012). Soul Medicine: Awakening Your Inner Blueprint for Abundant Health and Energy. United States: Hay House.

Circadian Clocks: Role in Health and Disease. (2016). United States: Springer New York.

Elkins, G. (2016). Handbook of Medical and Psychological Hypnosis: Foundations, Applications, and Professional Issues. United States: Springer Publishing Company.

Henwood, S., Lister, J. (2007). NLP and Coaching for Health Care Professionals: Developing Expert Practice. Germany: Wiley.

Jarmey, C., Hearn, G. (2001). The Book of Meditation: Practical Ways to Health and Healing. United States: Journey Editions.

Khalsa, S. B., Cohen, L., McCall, T., Telles, S. (2016). Principles and Practice of Yoga in Health Care. United Kingdom: Jessica Kingsley Publishers.

Luthra, O. P. (2016). Healing Without Medicine: Restoring Well-Being with Accupressure. India: B. Jain Publishers Pvt. Limited.

Nelson JB. (2017). Mindful Eating: The Art of Presence While You Eat. Diabetes Spectr. 2017 Aug;30(3):171-174.

Pittler, M. H., Wider, B. (2007). Complementary Therapies for Pain Management: An Evidence-based Approach. United Kingdom: Elsevier/Mosby.cis.

Sant R. S. (2012). Meditation as Medication for the Soul. India: Radiance Publishers.

Sarris, J., Wardle, J. (2010). Clinical Naturopathy: An Evidence-based Guide to Practice. United Kingdom: Elsevier Health Sciences.

Scott Shannon. (2002). Complementary and Alternative Strategies for Mental Health. Elsevier Inc

Tribole, E., Resch, E. (2020). Intuitive Eating, 4th Edition: A Revolutionary Anti-Diet Approach. United States: St. Martin's Publishing Group.

Evaluation:
2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Debates/Group Discussions/ Role Plays	10
Development of resources to understand a specified multidisciplinary approach for health maintenance and disease management intended for health practitioners, using appropriate review of disease management / completion of an online or in person short term course conducted by a certified practitioner to gain added knowledge in a specific multidisciplinary strategy (completion certificate to be submitted)	15
Preparation of learning resources (videos/ posters/ brochures) for nursing or dietetic students/ Class tests	10
Total	**25**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

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Semester- I **Major (Elective Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 5 Elective 2: B	**Multidisciplinary Approaches to Health and Disease Management**	**Practical**	**2**

Course Objectives:

1. To help students understand the principles of multidisciplinary strategies in preserving health and combating disease.
2. To equip students with skills to plan and organize information sessions on multidisciplinary strategies for health professionals and the community
3. To empower students with the skills to develop educational resources on multidisciplinary strategies in health preservation and as adjuncts in disease management for healthcare professionals and the community.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Outline the various alternative strategies for preserving health and for disease management.
CO2	Understand the various interactions between traditional therapy and alternative strategies.
CO3	Apply the concepts of healing and health preservation by alternative strategies to individual and community patient care.
CO4	Analyze the application possibilities of alternative strategies to disease management.
CO5	Evaluate and comprehend the short term and long-term effects and compliance with respect to alternative strategies as well as to be able to recommend suitable strategies for patient care.
CO6	Design seminars, workshops and education materials to empower practitioners/patients with information on alternative strategies for health and disease and its potential.

Unit No.	Course Content	No. of Hours
I.	**A. Planning and organizing information sessions and developing nutrition education resources with respect to Alternative Strategies to preserve health and combat diseases with lifestyle-based etiologies:** i Mindfulness and Intuitive Eating ii Yoga iii Physical Activity Therapy – Dance therapy, Martial Arts, Exercise Therapy iv Matching Circadian Rhythm v Ayurveda vi Hypnotherapy	**30**

	vii Naturopathy viii Any Other	
II.	**B. Planning and organizing information sessions and developing nutrition education resources with respect to Alternative Strategies to preserve emotional and mental well-being and for pain management:** i Meditation ii Energy healing iii Laughter therapy iv Acupuncture / acupressure v Massage Therapy vi Neuro Linguistic Programming vii Art Based Therapy viii Visualization ix Journaling and Reflection x Social support for Well being xi Any Other	**30**
	Total hours	**60**

References:

Alman, B. M., Lambrou, P. (2013). Self-Hypnosis: The Complete Manual for Health and Self-Change, Second Edition. United Kingdom: Taylor & Fran

Angleo, J. (2016). Spiritual Healing: Energy Medicine for Health & Well-being. United Kingdom: Pavilion Books.

Art Therapy and Health Care. (2012). United States: Guilford Publications.

Ayurveda: A Preventive Approach to Lifestyle Diseases. (2023). (n.p.): Book Bazooka Publication.

Bays, J. C. (2017). Mindful Eating: A Guide to Rediscovering a Healthy and Joyful Relationship with Food (Revised Edition). United Kingdom: Shambhala.

Church, D. (2012). Soul Medicine: Awakening Your Inner Blueprint for Abundant Health and Energy. United States: Hay House.

Circadian Clocks: Role in Health and Disease. (2016). United States: Springer New York.

Elkins, G. (2016). Handbook of Medical and Psychological Hypnosis: Foundations, Applications, and Professional Issues. United States: Springer Publishing Company.

Henwood, S., Lister, J. (2007). NLP and Coaching for Health Care Professionals: Developing Expert Practice. Germany: Wiley.

Jarmey, C., Hearn, G. (2001). The Book of Meditation: Practical Ways to Health and Healing. United States: Journey Editions.

Khalsa, S. B., Cohen, L., McCall, T., Telles, S. (2016). Principles and Practice of Yoga in Health Care. United Kingdom: Jessica Kingsley Publishers.

Luthra, O. P. (2016). Healing Without Medicine: Restoring Well-Being with Accupressure. India: B. Jain Publishers Pvt. Limited.

Nelson JB. (2017). Mindful Eating: The Art of Presence While You Eat. Diabetes Spectr. 2017 Aug;30(3):171-174.

Pittler, M. H., Wider, B. (2007). Complementary Therapies for Pain Management: An Evidence-based Approach. United Kingdom: Elsevier/Mosby.cis.

Sant R. S. (2012). Meditation as Medication for the Soul. India: Radiance Publishers.

Sarris, J., Wardle, J. (2010). Clinical Naturopathy: An Evidence-based Guide to Practice. United Kingdom: Elsevier Health Sciences.

Scott Shannon. (2002). Complementary and Alternative Strategies for Mental Health. Elsevier Inc

Tribole, E., Resch, E. (2020). Intuitive Eating, 4th Edition: A Revolutionary Anti-Diet Approach. United States: St. Martin's Publishing Group.

Evaluation:
2 credits (Total marks 50)

Continuous Internal Evaluation:	**Marks**
Planning and organizing an informative session for the class and the community on a specific multidisciplinary strategy	10
Design infographics, educational resources as brochures/videos/or other resources for creating community awareness of a specific multi-disciplinary approach and making a case study of its impact	15
Total	**25**

Semester-end Examination:	**Marks**
Developing a strategy for multidisciplinary approach strategy for management of a specific health condition	15
Journal	5
Viva-voce examination	5
Total	**25**

Semester-I: Research Methods in Home Science

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Semester- I **Major (Mandatory Course)**

Course Code	Title of the Course	Th/Pr	Credits
Course 6	**Research Methods in Home Science**	**Theory**	**4**

Course Objectives:

1. To facilitate in students appreciation for high quality research in their specialisation and allied areas.
2. To help students master the knowledge and skills needed in conducting specialisation-specific and interdisciplinary research relevant to the multiple disciplines under the umbrella of Home Science.
3. To promote academic, research and professional ethics in students.
4. To introduce students to principles of good scientific writing.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Have heightened appreciation for high quality research in their specialisation and allied areas.
CO2	Identify, differentiate between, evaluate, and select different sampling techniques and research designs for particular research aims.
CO3	Formulate a research proposal on a worthwhile topic in their discipline, as also on interdisciplinary topics.
CO4	Abide with ethical guidelines for research.
CO5	Contribute to their discipline through conducting primary and original research on socially relevant, green, and high priority topics.

Unit No.	Course Content	No. of Hours
I.	**A. Introduction and overview** i What is research? ii Importance of research in general, and in each specialisation of Home Science and allied areas; illustration of research in each specialisation of Home Science and allied areas iii Steps in the research process iv Qualitative versus quantitative research v Objectivity and subjectivity in scientific inquiry: Premodernism, modernism, and postmodernism **B. The beginning steps in the research process** i Identifying broad areas of research in a discipline ii Identifying interest areas; using multiple search strategies iii Prioritizing topics; specifying a topic; feasibility iv Review of literature/scholarly argument in support of study v Specifying research objectives/hypotheses/questions	**15**

II.	**A. Variables** i Definition ii Characteristics iii Types iv Levels of measurement **B. Measurement** i Conceptual definitions and operational definitions ii Types of validity and reliability in quantitative research **C. Data entry in quantitative research** i Codebook and mastersheet ii Creating data files and data management	**15**
III	**A. Sampling techniques in quantitative research** i Probability and nonprobability sampling methods in current use/examples from current research ii Issues with regard to sampling techniques **B. Research designs in quantitative research** Distinguishing between the following research designs; and, selecting research designs that are congruent with one's research purpose i Experimental, quasi-experimental, and pre-experimental research designs; correlational research design Inferring causality, internal validity, external validity ii Epidemiological research designs (cross-sectional, cohort, & case-control studies); developmental research designs (cross-sectional, longitudinal, sequential research designs; additive, mediator & moderator models; cross-lagged panel analyses); survey and market research designs; meta-analysis iii Exploratory, descriptive, and explanatory designs iv Mixed methods research designs	**15**
IV	**A. Qualitative research methods** i Ideology/worldview of the qualitative researcher ii Research designs in qualitative research iii Sampling techniques in qualitative research iv Data collection methods in qualitative research v Data analytic strategies in qualitative research vi Reporting of results in qualitative research **B. Scientific writing** i Distinguishing scientific writing from popular and literary writing styles ii Publication guidelines (APA7); characteristics/principles of scientific writing; examples of good scientific writing iii Writing a research proposal/research grant; seeking funding iv Reporting statistical findings in text **C. Ethics** i In academia ii In research in general iii In research with human participants (Nuremberg Code, Belmont Report, ICMR Guidelines) iv In research with animal subjects	**15**
	Total hours	**60**

References:

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Denzin, N. K., & Lincoln, Y. S. (2011). The Sage handbook of qualitative research. Sage.

Fraenkel, J. R., & Wallen, N. E. (2006). How to design and evaluate research in education (6th ed.). McGraw-Hill.

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Kerlinger, F. N. & Lee, H. B. (2000). Foundations of behavioral research. Harcourt.

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Rubin, A., & Babbie, E. R. (2011). Research methods for social work (7th ed.). Thomson, Brooks/Cole.

Evaluation:

4 credits (Total marks 100)

Continuous Internal Evaluation:	**Marks**
Written Short Quizzes	10
Short Exercises	10
Group project to be completed in pairs or threes: Formulating a Research Proposal on a High Priority Topic relevant to each student group's specialization; students can opt to work on interdisciplinary research project proposals with team members from more than one specialization of Home Science	30
Total	**50**

Semester-end Examination:	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from Unit 3	10
Question 4 from Unit 4	10
Question 5 from multiple units	10
Total	**50**

Letter Grades and Grade Points

Semester GPA/Programme CGPA Semester/ Programme	% of Marks	Alpha-Sign/ Letter Grade Result
9.00-10.00	90.0-100	O (Outstanding)
8.00-<9.00	80.0-<90.0	A+ (Excellent)
7.00-<8.00	70.0-<80.0	A (Very Good)
6.00-<7.00	60.0-<70	B+ (Good)
5.50-<6.00	55.0-<60.0	B (Above Average)
5.00-<5.50	50.0-<55.0	C (Average)
4.00-<5.00	40.0-<50.0	P (Pass)
Below 4.00	Below 40	F (Fail)
Ab (Absent)	-	Absent

Team for Creation of Syllabus

Name	College Name	Signature
Dr. Anuradha J. Bakshi I/C Principal	College of Home Science Nirmala Niketan	
Ms. Vibha Hasija Head of the Department	College of Home Science Nirmala Niketan	
Ms. Fatima Aziz Kader Assistant Professor	College of Home Science Nirmala Niketan	
Dr. Tasneem Hussain Ravat Assistant Professor (Temporary: Self-financed Faculty)	College of Home Science Nirmala Niketan	

Sign of Head of the Institute:

Sign of Dean:

Name of the Head of the Institute:
Dr. Anuradha J. Bakshi
(I/C Principal)

Name of the Dean:

Name of the Department:
Foods, Nutrition and Dietetics

Name of the Faculty:

Appendix B

Justification for P.G. Diploma in Home Science – Dietetics and Applied Nutrition

1.	Necessity for starting the course:	A 'P.G. Diploma in Dietetics and Applied Nutrition' is crucial to address the evolving complexities of nutrition and healthcare. This advanced degree equips students with specialized expertise, evidence-based practices, and clinical proficiency. The programme's interdisciplinary approach fosters collaboration with healthcare teams and prepares graduates for leadership roles in healthcare institutions, research, and public health interventions. Moreover, the programme aligns with the changing requirements for professional credentialing, offers opportunities for research and innovation, and meets the increasing demand for skilled nutrition professionals to tackle global health challenges. In a rapidly changing landscape of improved diagnosis and identification of early biomarkers of disease a 'P.G. Diploma in Dietetics and Applied Nutrition' meets the demand for a highly trained expert to plan out diet and nutrition based therapies. This programme provides an in-depth learning in various specialization areas of clinical nutrition addressing the need for both super-specialized and multi-disciplinary approach as a part of the health care team in total patient care and management. The Programme is designed to emphasize the application of evidence-based practice and enable interdisciplinary collaboration. The graduates in addition will be well-equipped to contribute to research advancements, use digital technology and apply entrepreneurial skills shaping the field's future trajectory and making substantial contributions to individual and public health. This course is in line with the values of the UN Sustainable Development Goals (SDGs) as well as the National Health Policy of Poshan Abhiyan, thus enabling the P.G. Diploma student to make strong and impactful contributions to national health. With NEP 2020, the time has come to meet the growing need for this program to transform into an M.Sc. Program. This extensive transfer of knowledge and skills is only possible with a two-year Master's degree. The program includes both classroom learning and intense industry interactions within the context of clinical nutrition. The qualification will be more valuable in addressing dietary concerns nationally and globally than the input received at the end of 1 year P.G. Diploma programme.
2.	Whether the UGC has recommended the course:	Yes, P.G. Diploma in Dietetics and Applied Nutrition shall commence from the academic year 2023-2024.
3.	Whether all the courses	P.G. Diploma in Dietetics and Applied Nutrition shall

	have commenced from the academic year 2023-2024:	commence from the academic year 2023-2024 (Pending approval). Semester I and Semester II shall commence from the academic year 2023-2024.
4.	The courses started by the University are self-financed, whether adequate number of eligible permanent faculties are available?	The course is SELF-FINANCED. Adequate eligible faculty members are recruited each year.
5.	To give details regarding the duration of the Course and is it possible to compress the course?	One Year Full Time (Two Semesters) It is NOT advisable to compress the Programme. However, with the extensive developments in the field, there is a strong need to convert it into a 2 years degree programme.
6.	The intake capacity of each course and no. of admissions given in the current academic year:	Intake Capacity: 20 Number of admissions given in the current academic year: 20
7.	Opportunities of Employability/ Employment available after undertaking these courses:	Graduates can excel as dietitians, clinical nutritionists, pediatric nutritionists, community health practitioners, researchers, corporate wellness consultants, nutrition educators, food product developers, private practitioners, public health specialists, fitness and sports nutrition consultants, academic instructors, media experts, and consultants. They can reach out with nutrition education and diet plans digitally across the country and the globe. This advanced programme equips graduates with specialized skills to impact individual health, community well-being, and nutrition science, making them valuable assets in healthcare, research, education, and various industries. Students have a great scope for entrepreneurial ventures and can institute nutrition clinics, nutrition and lifestyle related foods, meals and service endeavors either in person or digitally.

Sign of Head of the Institute: **Sign of Dean**:

Name of the Head of the Institute:
Dr. Anuradha J. Bakshi
(I/C Principal)

Name of the Dean:

Name of the Department:
Foods, Nutrition and Dietetics

Name of the Faculty: