



Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category A by MHRD, Estd. u/s 3 of UGC Act 1956)

Re-accredited with A+ Grade by NAAC. Recognised by UGC Under Section 12 B

Coimbatore - 641 043, Tamil Nadu, India

PG Diploma in Nutrition and Dietetics

(One year program with Internship)

Programme Specific Outcomes:

1. Understand the importance of food, nutrients and dietary management in normal and therapeutic conditions.
2. Devise dietary management strategies for empowering and promoting healthy living in the community.
3. Competent to take up careers in academics, health care food industry and foodservice industry.

Programme Learning Outcomes:

1. Apply acquired knowledge on foods, nutrition and dietetics in managing diseases and deficiency disorders.
2. Assess food nutrient quality and dietary intake for healthy living.
3. Design personalized nutritiously adequate, safe, locally available, cost effective and environmental friendly foods to suit dietary recommendations of all age groups.
4. Manage nutritional and diet related health problems considering food and nutrition quality.
5. Use appropriate techniques and digital tools in diet counselling.
6. Apply diet counselling skills in community and health care services.
7. Exhibit work ethics and norms adhering to all safety and standards protocol in food service operations.
8. Function self-reliantly and in team.
9. Communicate proficiently in both verbal and written forms.
10. Manage the manpower and resources relating to food, food service and in dietary department.
11. Adopt acquired knowledge in day to day practices.

Scheme of Instruction and Examination
(For Students admitted from 2021-2022 & onwards)

Semester	Subject Code	Name of Paper/ component	Hours of instruction/week		Scheme of Examination				
			T	P	Duration of exam	CIA	CE	Total	Credit
I	21PDND01	Fundamentals and Principles of Food Science	5	-	3	40	60	100	4
	21PDND02	Techniques in Food Science – Practical	-	3	3	100	-	100	2
	21PDND03	Human Nutrition	5	-	3	40	60	100	4
	21PDND04	Clinical Nutrition	5	-	3	40	60	100	5
	21PDND05	Dietetics	5	-	3	40	60	100	4
	21PDND06	Dietetics Practical	-	4	3	100	-	100	3
	21PDND07	Registered Dietitian Compliance Course- self study	1	-	3	100	-	100	1
		CSS	2	-	-	-	-	-	-
II	21PDND08	Dietetics Internship*	6	-	**	-	-	100	5
	21PDND09	Food Microbiology and Food Safety	5	-	3	40	60	100	3
	21PDND10	Food Production and Service in Dietaries	5	-	3	40	60	100	3
	21PDND11	Food Production and Service- Practical	-	3	3	100	-	100	4
	21PDND12	Hospital Dietary Food Service Management	5	-	3	40	60	100	4
	21PDNDE1a/ 21PDNDE1b	Patient Counselling Techniques/ Diabetes Counselling	4	-	3	40	60	100	2
	21MSXCS1	CSS	2	-	3	-	100	100	1
									Total credits

*Dietetics Internship for 45 days in a multispeciality hospital with a well established dietary department.

Fundamentals and Principles of Food Science

Semester I
21PDND01

Hours of instruction per Week: 5
No. of Credits: 4

Course Objectives:

1. Understand the principles and chemistry of foods.
2. Gain knowledge on functions of food and nutrients in relation to health and diseases.
3. Acquire skills in various food processing and preparation techniques.

	Hours
Unit I Food Groups, Sensory Methods of Assessment, Emulsion and Colloids	15
Definition, classification of foods according to functions, origin. Need for grouping foods, functional foods, and designer foods. Sensory evaluation of foods – subjective and objective, Food emulsion, colloids and stabilizing agents, types, physical and chemical properties and its application in food preparation.	
Unit II Cereals and Pulses	14
Structure, Composition and nutrient content, milling and parboiling of cereals. Types of starch, effect of cooking, gelatin, factors affecting gluten formation. Leavening agents (natural and chemical). Types of pulses, nutrient content, soaking and germination of pulses, processing, effect of cooking pulses, factors affecting cooking quality of pulses, toxic constituent of pulses, role of pulses in cookery.	
Unit III Sugar, Fats and Oil	13
Sources, uses, properties, composition and characteristics of sugar. Types, sources, characteristics, physical and chemical properties of fats and oils. Crystallization and stages of sugar cookery. Changes during storage and cooking, shortening property of fats and rancidity.	
Unit IV Meat, fish and poultry, eggs, vegetables, fruits and milk and milk products	17
Structure, composition, selection and storage of eggs, meat, poultry and fish. Properties and coagulation of egg protein, factors affecting coagulation of egg, uses of egg in cookery. Grading, cuts of meat, post-mortem changes in meat and fish. Changes during storage and cooking of meat and fish. Factors affecting tenderness of meat. Types of milk, coagulation and problems in milk cookery.	

Unit V Vegetables, Fruits

Composition, structure, properties and uses of vegetables, fruits and milk in cookery. Browning reaction, selection and storage of vegetables and fruits. Common pigments used in food industry (chlorophylls, flavonoids, synthetic colors, carotenoids & others).Cooking losses of vegetables and fruits. Changes in vegetables and fruits cookery.	16
Total Hours	75

Text Books:

1. **Sri Lakshmi, B. (2020)**, Food Science, New Age International (P) Ltd Publishing House , New Delhi.
2. **ShakuntalaManay and ShadakSharaswamy (2020)**, Foods, Facts and Principles, 2nd Edition, New Age International Publishers, New Delhi.
3. **Potter, N .M. (2015)**, Food Science, The AVI Publishing Company, Inc, West Port Connecticut, USA.

Reference Books:

1. **MohiniSethi and Rao.S. (2019)**, Food Science Experiment and Applications, Second Edition Published by S.K Jain for CBS Publishers and Distributors, New Delhi.
2. **Brown, A. (2014)**, Understanding Food Principles and Preparations, 5thEdition, Wadsworth Publishers, U.S.
3. **Mirajkar (2010)**, Food Science and Processing Technology, Biochemistry of Food and Nutrition, Kanishkha Publications.

Journals:

1. Food Processing, Potman Publishing Company, New York, U.S.A.
2. Journal of Food Technology, the Institute of Food Technology, Illinois, USA.
3. Journal of Food Science and Technology.

Websites:

1. <https://www.ift.org/>
2. <https://link.springer.com/>
3. <https://www.mcgill.ca>

Course Learning Outcomes:

1. Understand the nutritional composition of food groups.
2. Comprehend the functional properties of different food groups and their dietary applications.
3. Recollect the effect of cooking on nutrient and over all acceptability of foods.
4. Identify and rectify problems in basic cookery with relevance to nutrient conservation and organoleptic characteristics.
5. Develop novel food products.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	M	L	-	-	M	L	M	L	L	-	H	H	L	M
CLO 2	H	M	M	-	L	M	L	M	M	M	H	H	L	M
CLO 3	H	H	M	M	H	-	L	-	L	M	H	L	L	H
CLO 4	M	M	M	H	H	M	M	-	L	-	H	M	L	M
CLO 5	M	M	H	M	L	-	-	L	M	M	H	L	M	H

Techniques in Food Science- Practical

Semester I
21PDND02

Hours of instruction per week: 3
No. of Credits: 2

Course Objectives:

1. Understand the subjective and objective methods of evaluating foods.
2. Acquire skills in cooking different food groups.
3. Learn different factors affecting cooking quality of foods.

	Hours
Unit I Sensory Evaluation Acceptability and analysis of foods by sensory methods.	6
Unit II Sugar and Starch Cookery Crystallization of sugar, stages of sugar cookery, Preparation of fondant, fudge, Factors affecting crystallization of sugars. Microscopic examination of different starches. Gelatinization of starches-Preparation of gluten and factors affecting gluten formation.	12
Unit III Pulses, Fats and Oils Factors affecting cooking quality of pulses- Hard and soft water, acid, alkali and salt. Smoking temperature of different fats and oil and factors affecting absorption of fat.	9
Unit IV Vegetables, Fruits and Milk Effect of acid, alkali, metals and temperature on vegetables and fruits pigments, browning reactions in fruits and vegetables. Effect of curdling of milk.	8
Unit V Eggs, Meat, Fish and Poultry Testing the quality of eggs. Effect of coagulation of eggs (Boiling and poaching omelets, Scrambled egg preparation). Factors affecting coagulation in custards, doneness of meat, fish and poultry for cooking methods – boiling and frying. Effect of frying and stewing on doneness of meat.	10
Total Hours	45

Text Books:

1. **Sharma .A. (2019)**, Text Book of Food Science and Technology, CBS Third Edition Publishers& Distributors Pvt.Ltd.
2. **MohiniSethi and Rao.S. (2019)**, Food Science Experiment and Applications, Second edition Published by S.K Jain for CBS Publishers and Distributors, New Delhi.
3. **Roday, S. (2018)**, Food Science and Nutrition, Second Edition Published by Oxford University Press.

Reference Books:

1. **Meyer, L.H. (2019)**, Food Chemistry, Van Nostrand, ReenHald Company, New York and London.
2. **Brown, A. (2018)**, Understanding Food Principles and Preparations, Wadsworth Publishers, U.S.
3. **Parker, P. (2018)**, Introduction to Food Science, Delmer Publications, U.S.

Websites:

1. <https://www.fda.gov>
2. <https://foodscience.ucdavis.edu>
3. <https://ncert.nic.in>

Course Learning Outcomes:

1. Select foods based on nutritional and functional properties.
2. Adapt right pre-preparation, preparation and processing methods to conserve nutrients.
3. Modify quality attributes of foods for therapeutic use.
4. Evaluate food products.
5. Apply food science concepts in formulation of diet.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	L	-	-	M	M	H	L	L	M	M	H	M	L	H
CLO 2	M	M	M	L	-	H	M	L	L	M	-	M	L	M
CLO 3	-	H	H	-	M	H	-	M	L	-	M	L	M	H
CLO 4	-	H	-	H	H	H	M	M	L	M	H	L	M	M
CLO 5	M	M	H	M	L	-	M	L	L	M	M	M	L	H

Human Nutrition

Semester I
21PDND03

Hours of instruction per Week: 5
No. of Credits: 4

Course Objectives:

1. Understand the different nutrients essential for health.
2. Gain knowledge on nutritional needs of various age groups.
3. Acquire skills to overcome nutritional diseases.

	Hours
Unit I Nutritional Status and Energy Balance The relation of good nutrition to normal physical development and good health, methods of assessing nutritional status. Definition of calorie and joule, measurement of calorific value of foods, basal metabolism, measurement of energy balance of the body, direct and indirect calorimetry.	16
Unit II Carbohydrates, Proteins and Lipids Types, classification, functions, sources, metabolism, requirements, digestion, absorption and transport of carbohydrates, proteins and lipids. Glycemic index of foods- Calculation and GI of common foods.	18
Unit III Minerals Functions, sources, deficiency and requirements of calcium, phosphorus, magnesium, sodium, potassium, iron, copper, cobalt, zinc, iodine, manganese, fluorine, molybdenum, selenium and chromium.	12
Unit IV Vitamins History, Classification on the basis of solubility, absorption, metabolism, Functions, sources and requirements. Deficiency of: - Vitamin A, D,E,K, - Vitamin C and B complex vitamins.	18
Unit V Water, Electrolyte balance and Fiber Body water compartments, Regulation of water balance and electrolyte balance Disorders of water balance, losses and replenishment, role of hormones and kidneys in their balance. Hydrogen ion homeostasis and acid base balance. Fiber- Definition, types, functions and sources.	11
Total Hours	75

Text Books:

1. **Marie Kainoa Fialkowski Revilla., Alan Titchel and Jennifer Draper. (2020)**, Human Nutrition, University of Hawai, Manoa
2. **Srilakshmi. B. (2018)**, Human Nutrition, 2nd Edition, New Age International Publishers.
3. **Mahan, K.L., and Stumph S. E. (2016)**, Krause Food, Nutrition and Diet therapy, 14th edition, W.B.Saunders Company.

Reference Books:

1. **Denis M. Medeiros., Robert E.C Wildman., (2018)**, Advanced Human Nutrition, 4th edition, Jones and Bartlett Publishers, Inc.
2. **Jim Mann and Stewart Truswell, (2017)**, Essentials of Human Nutrition, 5th edition, Oxford University Press.
3. **Carolyn D. Berdanier., Johanna T.Dwyer and David Heber (2014)**, Handbook of Nutrition and Food, 3rd edition, CRC Press, Taylor and Francis
4. **Eastwood M.A., (2013)**, Principles of Human Nutrition, 3rd edition, Springer US.

Journals:

1. Indian Journal of Nutrition and Dietetics, Avinashilingam University, Coimbatore.
2. Journal of American Dietetic Association, published by American Dietetic Association.
3. British Journal of Nutrition.
4. Journal of Human Nutrition and Dietetics.

Websites

1. <https://www.acsedu.co.uk>
2. <https://www.britannica.com>
3. <http://www.fao.org>

Course Learning Outcomes:

1. Acquire in depth knowledge on nutritional quality of foods.
2. Recollect symptoms of nutrient related diseases and disorders.
3. Suggest measures to overcome nutritional deficiency diseases.
4. Exhibits professionalism in planning dietary recommendations.
5. Competent in planning healthy diet for all age groups.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	M	M	H	M	H	M	M	L	L	M	H	M	-
CLO 2	-	-	M	M	M	H	-	M	L	M	M	H	H	M
CLO 3	M	M	-	-	L	H	-	M	L	-	H	H	H	M
CLO 4	H	H	-	H	M	-	M	L	L	-	M	H	H	M
CLO 5	M	M	H	H	L	-	M	L	L	L	M	H	H	H

Clinical Nutrition

Semester I
21PDND04

Hours of instruction per Week: 5
No. of Credits: 5

Course Objectives:

1. Gain knowledge on metabolic processes of normal and diseased organs and tissues.
2. Acquire knowledge on the effect of various diseases on nutritional status and nutrient requirements.
3. Correlate dietary modifications based on physiological changes occurring in disease conditions

	Hours
Unit I Disorders of Carbohydrate Metabolism	15
Review of aerobic and anaerobic metabolism of carbohydrates, generation of ATP, storage and utilization of carbohydrates as energy source for physical activity. Disorders of Carbohydrate metabolism in Diabetes mellitus	
Unit II Disorders of Lipid Metabolism	18
Review of metabolism of fats and fatty acids. Role of liver and adipose tissue in fat metabolism. Cardiovascular diseases- Etiology, symptoms, role of specific nutrients. Clinical findings related to nutritional care during hypertension, atherosclerosis.	
Unit III Energy Metabolism	15
Total energy requirement, nutrient contribution to meet energy requirement. Measurement of human energy expenditure. - Thermic effect of food - Factors affecting total energy requirement	
Unit IV Diseases of Gastro-Intestinal tract, Renal diseases	18
Clinical manifestation in gastritis and ulcers, diarrhoea, constipation, colitis, malabsorption syndromes. Liver, gall bladder and pancreatic diseases – etiology and symptoms. Metabolic and clinical implications of hepatitis, cirrhosis, hepatic coma, pancreatitis, cystic fibrosis, cholecystitis, cholelithiasis. Renal systems - Etiology, symptoms and clinical implications of nephritis, nephrotic syndrome, renal failure, renal calculi.	

Unit V Nutrient and Drug interaction and Defense Mechanisms of the body	9
Effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, Effect of foods, nutrients and nutritional status on drug dosage and efficacy, localization of infection, inflammation and immunization.	

Total Hours 75

Text Books:

1. **Paul.S. (2018)**, A Textbook of Bio-Nutrition (Curing diseases through diet) , CBS Publishers and distributors.
2. **Tom Brody (2017)**, Nutritional Biochemistry, 2nd edition, Elsevier publication.
3. **Michael .J.Gibney (2013)**, Clinical Nutrition, Kindle edition.

Reference Books:

1. **Ridley, J.W (2018)**, Fundamentals in the study of urine and body fluids, Springer.
2. **GeethaDamodaran (2016)**, Practical biochemistry, Second Edition, Jaypee Brothers Medical Publishers Pvt Ltd.
3. **Rodwell,W., Bneder, D.,Veil, A.P., Kennely, P. and Botham, K (2015)**, Harpers Illustrated Biochemistry, 30th edition, McGraw- Hill.
4. **Burtia, C, A., Ashwood, E. R., (2014)**, Fundamentals of Clinical chemistry, 7th Edition, W. B. Saunders Company.

Journals:

1. The Indian Journal of Nutrition and Dietetics, Avinashilingam University, Coimbatore.
2. Metabolism, Clinical and Experimental.
3. Trends in Biochemical Science.

Websites:

1. www.biochemistry.org (Biochemical Society)
2. www.acb.org.uk
3. <https://www.who.int>

Course Learning Outcomes:

1. Knowledge on the functions of various systems and the changes in diseased conditions.
2. Comprehend the metabolic derangement in diseases.
3. Identify clinical sign and symptoms for diet related diseases and disorders.
4. Relate the clinical signs and symptoms to practical diet requirements.
5. Apply principles of nutrition in disease prevention and treatment.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	L	M	M	M	H	L	M	L	M	M	H	L	L
CLO 2	H	M	H	H	M	H	-	-	L	-	M	H	L	L
CLO 3	H	-	M	-	M	H	-	M	L	L	M	H	L	L
CLO 4	H	-	L	M	M	H	-	M	L	M	M	H	M	L
CLO 5	H	M	-	H	M	L	-	M	L	M	M	H	L	H

Dietetics

Semester I
21PDND05

Hours of instruction per Week: 5
No. of Credits: 4

Course Objectives:

1. Understand the role of a dietitian.
2. Gain knowledge about the principles of diet therapy and different therapeutic diets.
3. Develop aptitude for taking up dietetics as a profession.

	Hours
Unit I Concept Dietary Management, role and responsibilities of dietitian	15
Routine hospital diets Introduction to dietetics-definition, history and development, principles of diet therapy, Therapeutic adaptations of normal diet. Psychology of feeding the patients. Assessment of patient needs, Dietitian-roles and responsibilities, Professional code and ethics, Procedure to become Registered Dietitian. Patient Care and Counselling, Regular diet, Light diet, Soft diet, Clear diet, Full liquid diet, Enteral and Parenteral feeding. Mode of feeding methods.	
Unit II Febrile conditions and diet during burns	13
Nutrition and Infection, Metabolic changes during Infection, Typhoid, fever, Tuberculosis, malaria, influenza, Burns- metabolic changes and Dietary management, Pre and post-operative diets.	
Unit III Dietary management of gastrointestinal disorder, liver disorders	16
Dietary management of renal diseases, Functions of gastrointestinal systems, Liver, Gall bladder- Cholecystitis, Cholelithiasis Etiology, diagnostic, symptoms, causes, dietary management of Gastrointestinal diseases, Liver disorders -Hepatitis, Cirrhosis of liver, Hepatic encephalopathy, Hepatic coma, Renal diseases-Glomerulonephritis, Nephrotic Syndrome ,Acute Renal Failure, Chronic Renal Failure, Urolithiasis, Kidney transplant, dialysis.	
Unit IV Dietary management of cardio vascular disease, diabetes, obesity and underweight	15
Classification, Risk factors, causes, symptoms, diagnosis, dietary management of Cardiovascular diseases, diabetes, obesity and underweight.	

Unit V Dietary management in cancer and AIDS, Nutritional deficiencies and Allergy 16

Risk factors Metabolic Alterations and Nutritional Problems related to Cancer
Nutritional requirements of Cancer patients related to Cancer Therapy, Cancer
Prevention, HIV Infection and AIDS, Anaemia, Vitamin A deficiency, PEM, Lactose
Intolerance, Food Allergy, Phenylketonuria.

Total Hours 75

Text Books:

1. **Mahan, L.K. and Stump, S.E., (2017)**, Krause's Food, Nutrition and Diet Therapy 11th Edition, W.B. Saunders Co.
2. **Passmore, D, P, Break, J.P, (2016)**, Human Nutrition and Dietetics, English Language Book Society, Livingston.

Reference Books:

1. **Mahan L.K. and Raymond, J.L.(2016)**, Krause's Food & the Nutrition Care Process (Krause's Food & Nutrition Therapy) New York, NY : Ferguson.
2. **Srilakshmi, B., (2014)**, Dietetics, New Age International.

Journals:

1. Indian Journal of Nutrition and Dietetics ,Published by Avinashilingam University
2. American Journal of Dietetics Association, USA.
3. Australian Journal of Nutrition and Diet.

Websites:

1. <http://idaindia.com/>
2. <https://jandonline.org/>
3. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/dietetics>

Course Learning Outcomes:

1. Understand the Fundamental concept of dietetics.
2. Identify causes and symptoms of diet related disorders.
3. Use digital tools to recommend customized diet for diseases and disorders.
4. Work as a dietitian independently or in a team.
5. Manage and administer the dietary department.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	H	H	M	-	-	-	M	L	M	H	H	H	H
CLO 2	H	-	-	M	M	M	L	L	L	M	H	M	M	H
CLO 3	-	L	H	M	H	-	M	M	L	M	M	H	H	H
CLO 4	M	M	-	-	M	L	-	M	L	L	M	H	H	H
CLO 5	L	L	H	H	H	H	M	-	L	-	H	L	L	H

Dietetics Practical

Semester I
21PDND06

Hours of instruction per Week: 4
No. of Credits: 3

Course Objectives:

1. Develop skills in planning and preparing therapeutic diets.
2. Learn techniques in diet counselling and feeding of patients.
3. Plan and prepare appropriate diets for therapeutic conditions.

	Hours
Unit I Hospital Diets, Febrile conditions	9
Preparation of regular, clear liquid, full fluid and soft diets.	
Preparation of diets in acute chronic and recurrent infections.	
Unit II Gastro intestinal disorders, Liver and Gall bladder disorders	12
Diet in diarrhea, constipation, peptic ulcer. Diet in hepatitis, cirrhosis, cholecystitis, cholelithiasis.	
Unit III Metabolic disorders , Cardiovascular diseases	12
Diet in diabetes mellitus type I, II and Gestational diabetes.	
Diet in atherosclerosis, hypertension and low sodium diets.	
Unit IV Renal disorders, Obesity and Underweight	12
Diet in nephritis, nephrosis , nephrolithiasis, acute and chronic renal failure .	
Diet in obesity and underweight.	
Unit V Nutritional deficiency Diseases, Pediatric diets, Diet in Cancer and AIDS, Diet Counselling	15
Diet in Protein, Calorie Malnutrition, Vitamin A Deficiency and Anemia.	
Diet in lactose intolerance, juvenile diabetes and inborn errors of metabolism AIDS, Cancer, and Elimination diets.	
Total Hours	60

Text Books:

1. **Gopalan C, Rama Sastri B.V.,Balasubramanian, S.C., (2017)**, Nutritive Value of Indian Food.
2. **Passmore, D.P, Break, J.P(2016)**, Human Nutrition and Dietetics, English Language Book Society, Livingston.
3. **Rose, M.S (2010)**, A Laboratory handbook for Dietetics, 4th edition, McMillan publishing.

Reference Books:

1. **Paul.S. (2018)**, A Textbook of Bio-Nutrition (Curing diseases through diet) , CBS Publishers and distributors
2. **Marcia NahikianNelms, (2016)**, Medical Nutrition Therapy: A Case-Study Cengage Learning Boston, USA.
3. **Mahan, L.K. and Stump, S.E., (2010)**, Krause’s Food, Nutrition and Diet Therapy 11th Edition, W.B. Saunders Co.

Websites:

1. <http://idaindia.com/>
2. <https://jandonline.org/>
3. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/dietetics>

Course Learning Outcomes:

1. Plan and prepare diets for various diseases conditions.
2. Assess anthropometric, clinical and dietary habits of population groups.
3. Use digital diet tools to formulate diets and calculate their nutrient content.
4. Give diet counselling and nutrition education to community.
5. Translate acquired professional training skills in the managing a dietary department.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	-	-	M	L	M	L	M	L	L	H	H	H	H
CLO 2	H	H	H	M	M	-	M	L	L	L	M	M	M	H
CLO 3	M	M	M	-	-	H	-	M	L	M	M	M	M	H
CLO 4	H	-	-	H	M	M	M	-	H	H	H	H	H	H

Registered Dietitian Compliance Course- self study

Semester I
21PDND07

Hours of instruction per Week: 1
No. of Credits: 1

Course Objectives:

1. Know scope of Registered Dietitian.
2. Gain knowledge to become a Registered Dietitian.
3. Acquire aptitude skills to appear for the Examination.

	Hours
Unit I International and National Dietetic forum Genesis, Code of ethics, objectives and functions.	3
Unit II Registered Dietitians Introduction, Eligibility Requirements to become a Registered Dietitian. Components of RD training, Hospitals for R.D training in India.	3
Unit III Review of Questions –Paper I Outline of syllabus and Practice sessions for Questions -Human Physiology, Biochemistry, Physiologic and Metabolic Changes in Disease, Food Microbiology, Sanitation and Hygiene.	3
Unit IV Review of Questions – Paper II Outline of syllabus and Practice session for Questions- Human Nutrition and Meal Management, Community Nutrition, Diet Therapy, Nutrition Education and Dietetic Counselling and Food Services Management.	3
Unit V Registered Dietitian Examination Preparation for RD exam- Model Exams and Periodic test from Question bank.	3
Total Hours	15

Text Books:

1. **Sembulingam (2019)**, Essentials of Medical Physiology, Jaypee brothers Medical Publishers(P)Ltd, New Delhi.
2. **Morgan, J.B., Dickerson, J.W.T. (2003)**, Nutrition in Early Life, John Wiley and Sons Ltd.
3. **Garrow, J.S., James, W.P.T. and Ralph (2000)**, A. Human Nutrition and Dietetics, Churchill Livingstone.

Reference Books:

1. **Mahan, L.K. and Stump, S.E., (2017)**, Krause's Food, Nutrition and Diet Therapy, 11th Edition, W.B. Saunders Co.
2. **Sethi, M., Malhan, S., (2007)**, Catering Management, Wiley Eastern Ltd.
3. **Kinton. R and Cesarani .V. (2007)**, The Theory Of Catering Edward Arnold Publishers, New York.

Websites:

1. <http://idaindia.com/>
2. <https://www.eatrightpro.org/practice/code-of-ethics/ethics-education-resources>
3. www.healthline.com

Course Learning Outcomes:

1. Demonstrates essential quality attributes of a dietitians.
2. Aware of national and international dietetic forum and their functions.
3. Recollect in-depth knowledge in planning diets for various diet related disease and disorders.
4. Communicate the planned diet to patients clearly.
5. Equip to become a registered dietitian in health service industry.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	-	-	M	M	-	-	-	M	M	H	H	M	M	H
CLO 2	L	M	L	M	M	M	M	M	L	M	M	L	L	H
CLO 3	M	M	-	L	L	L	M	M	M	H	H	M	M	H
CLO 4	H	M	M	M	M	M	L	L	H	H	H	M	M	H
CLO 5	-	M	H	-	M	M	M	-	L	L	H	H	H	H

Dietetics Internship

Semester II
21PDND08

No. of credits: 5

Hospital Internship PG Diploma – Multispecialty RD recognised hospital for 45 days

1. Observe different sections in dietary department.
2. Prepare a lay out of the dietary department.
3. Preparation of formula feeds and tube feeds.
4. Take up hospital rounds with senior dietician to assess patient's dietary needs ICU, NICU, CCU.
5. Read and comprehend case sheet of the patients (Critical care, Dialysis patients, Pediatrics, Cancer. GDM mothers, CVD, Diabetics with complication and Burns).
6. Screening of patients for nutritional status.
7. Take diet history of the patients calculate carb count of patients.
8. Plan customised MNT protocol.
9. Calculate nutritive value of the planned diet.
10. Develop novel dietary approaches taking into account the nutraceutical properties of food groups.
11. Setting up of diet tray in the dietary department.
12. Follow up of patient's case sheet and diet history.
13. Experience in outpatient diet counselling, online counselling, group counselling, weight management and modification of life style.
14. Preparation of diet counselling materials (Charts, Power point presentation, Models, Video).
15. Preparation and presentation of three case study /Mini project and short communication for publication.
16. Maintenance of Dietary internship log book.
17. Internship Report writing.
18. Listing of individuals learning out comes from internship.

Food Microbiology and Food Safety

Semester II
21PDND09

Hours of instruction per Week: 5
No. of Credits: 3

Course Objectives:

1. Understand the common microorganisms associated with food spoilage and food borne illness.
2. Gain knowledge on the beneficial effects of microorganisms on food.
3. Learn the concepts and practice of hygiene and safety in food preparation and service.

	Hours
Unit I Fundamentals of Microbiology History of microbiology, importance in food technology and human welfare. Microorganism- mold, yeast, virus and bacteria, their classification, morphology, growth and reproduction. Microbial growth pattern, significance and control of organisms	12
Unit II Environmental and Food Microbiology Water Microbiology –Contamination .bacteriology of water, testing the sanitary quality of water, Purification of water. Air Microbiology – sources of contamination, air borne of diseases and control of microorganism. Microorganisms in spoilage, contamination and control in different kinds of foods- Cereals and bread ,Milk and milk products, Meat, poultry, egg, and fish. Vegetables and fruits. Different types of preservation techniques for fruits and vegetables.	18
Unit III Food Spoilage and Control of Microorganism Factors affecting food spoilage, types of food spoilage and Prevention of spoilage. Food poisoning, food borne infections, food borne diseases and food intoxication- outbreak and prevention. Control of microorganisms – Sterilization (physical agents) and Disinfectants (Chemical agents).	15
Unit IV Food Safety, Quality Control and Sanitation Environmental safety and hygiene, Safety in food procurement, storage, handling and preparation, hygiene practices in handling and serving. Planning and implementation of training programme for food service personnel.	18

Unit V Food Laws and Standards –Assessing the microbiological quality of food **12**
Microbiological standards, principles of GMP, GHP and FSSAI, HACCP in food processing, safety management at household and industrial level. Food Laws – PFA, FPO, MPO, MMPO, AGMARK and ECA

Total Hours **75**

Text Books:

1. **Roday S. (2018)**, Food Hygiene and Sanitation, Tata McGrawill Publishing Company Limited, New Delhi.
2. **Adams M.R and Moss, M.O, (2015)**, Food Microbiology, New Age International Publishers, New Delhi.
3. **Frazier, W.C and Westhoff, D.C, (2015)**, Food Microbiology, Tata MC Graw Hill publishing Company Ltd.

Reference Books:

1. **Neal D. (2016)**, Fortin. Food regulation, Wiley Publishers.
2. **Maier,R,N, Depper,I,L, Roge,C (2015)**, Environmental Microbiology, Academic press, London.
3. **O’Rourke, (2014)**, European Food law, 3rd Edition, Thomson, Sweet and Maxwell.
4. **Sara Mortimore and Carol Wallace (2013)**, HACCP - A practical approach. Third edition. Chapman and Hall, London.

Journals:

1. Journal of Food Protection.
2. Journal of Food science.
3. Journal of Food Microbiology.
4. Applied and Environmental microbiology.

Websites:

1. <https://www.springer.com/series/7131>
2. <https://www.who.int/activities/assessing-microbiological-risks-in-food>
3. www.webMD.com

Course Learning Outcomes:

1. Understand the process of contamination and spoilage in foods.
2. Suggest appropriate measures to prevent microbial spoilage in foods.
3. Assess microbial safety of foods and food products.
4. Apply the food safety and quality control in food service operations.
5. Implement various quality assurance systems in food industries.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	M	M	H	-	-	L	M	M	M	L	M	M	L	M
CLO 2	L	M	H	-	L	L	M	M	M	M	H	L	L	M
CLO 3	M	H	M	-	-	-	L	M	M	M	M	M	L	M
CLO 4	M	H	M	L	L	L	-	H	M	M	H	M	L	H
CLO 5	-	H	M	-	-	L	M	H	M	M	H	M	L	H

Food Production and Service in Dietaries

Semester II
21PDND10

Hours of instruction per Week: 5
No. of Credits: 3

Course Objectives:

1. Gain knowledge and develop skills in handling food service equipment.
2. Apply knowledge in space allocation of food plants.
3. Competent to plan, prepare, present and calculate the cost of recipes.

	Hours
Unit I Equipment in Dietary Food Service	17
Centralized and decentralized service, Traditional, Commissary, Ready prepared-Cook chill, Cook freeze, Assembly / Service system. Classification of equipment, factors influencing the use of equipment in hospital food service dietaries, care and maintenance.	
Unit II Food Plant and Kitchen Planning for hospital dietaries	17
Space allocation of food plant according to different capacities, different types of kitchen, Lighting and ventilation, Work centers in relation to equipment, Purchasing, receiving, storage, production and service. Sanitation of plant, garbage disposal.	
Unit III Menu production, planning, standardization	15
Menu- pattern, pricing and evaluation, standardization of recipes and portion control. Softwares in menu planning.	
Unit IV Energy management for different cooking methods	14
Types, applications and limitations of various forms of energy (Electricity, Solar, Bio-gas, fuel) Finishes used for- equipment, Walls and Floors, Basic concepts, safety and security aspects. Environmental benefits of different forms of energy.	
Unit V License Food service operations	12
Health License, Food Handler's license, Municipal rules and regulations	
Total Hours	75

Text Books:

1. **Andrews, S., Hotel Housekeeping Training Manual (2013)**, Tata McGraw – McGraw Hill Publishing Co Ltd, New Delhi.
2. **James A. Bardi (2010)**, Hotel front office management, 5th edition; John wiley& Sons, Inc.
3. **Kinton, R, Cessarani, V. and Foskett, D (2009)**,The Theory of Catering. Hodder and Stoughton.

Reference Books:

1. **K.S. Negi, (2011)**,A textbook of Hotel Management, wisdom press.
2. **O’Fallon.M,J. and Rutherford, D.G. (2011)**, Hotel Management and Operations, 5th edition, John Wiley and sons.
3. **Sethi, M (2011)**, Institutional Food Management. New age International (P) Limited. Second edition.

Websites:

1. <https://fppn.biomedcentral.com/>
2. <https://www.betterhealth.vic.gov.au/health/healthyliving/food-processing-and-nutrition>

Course Learning Outcomes:

1. Gain in-depth knowledge in food production techniques.
2. Acquire skills in food service techniques.
3. Utilize resource effectively in food production and service adhering all safety norms.
4. Plan and manage food production and service facilities in food service operations.
5. Implement food quality control using modern and digital tools.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	M	H	L	-	H	M	L	L	L	M	L	M	M
CLO 2	H	M	H	-	-	H	L	M	M	M	M	L	M	M
CLO 3	M	H	M	M	H	-	M	-	L	M	M	L	M	M
CLO 4	M	H	M	M	L	-	M	-	L	M	M	L	M	M
CLO 5	M	M	M	M	H	H	M	L	L	M	M	L	M	M

Food Production and Service – Practical

Semester II
21PDND11

Hours of instruction per Week: 3
No. of credits: 4

Course Objectives:

1. Understand different methods of cooking.
2. Gain skills in preparing national and international cuisines.
3. Attain hands-on expertise in setting a cover and napkin fold.

	Hours
Unit I Basic preparation of soup and sauce Thick, thin, spicy and creamy	10
Unit II National cuisine Preparation of recipes from South, North, East, West regions and traditional recipes.	10
Unit III International cuisine Preparation of recipes from Continental, Chinese, French and Italian	13
Unit IV Quantity Food Production Standardization, enlarging recipes, Cost calculation	6
Unit V Setting up cover and Napkin folds Table d'hôtel, A'la carte, High tea, Breakfast menu, Lunch Peacock folding, Fan folding, Cover folding, Fisherman's cap folding	6
Total Hours	45

Text Books:

1. **Andrews, S., Hotel Housekeeping Training Manual (2013)**, Tata McGraw – McGraw Hill Publishing Co Ltd, New Delhi.
2. **Kinton, R., Cessarani, V. and Foskett, D (2012)**, The Theory of Catering. Hodder and Stoughton.
3. **James A. Bardi (2010)**, Hotel front office management, 5th edition; John wiley& Sons, Inc.

Reference Books:

1. **Negi, K.S. (2011)**, A textbook of Hotel Management, wisdom press.
2. **O’Fallon.M,J. and Rutherford, D.G. (2011)**, Hotel Management and Operations, 5th edition, John Wiley and sons.
3. **Sethi, M (2011)**, Institutional Food Management. New age International (P) Limited. Second edition.

Websites:

1. <https://fppn.biomedcentral.com/>
2. <https://www.betterhealth.vic.gov.au/>
3. <https://ncert.nic.in/textbook/pdf/lehe104.pdf>

Course Learning Outcomes:

1. Plan menu for different cuisines.
2. Prepare a course of menu for nation and international cuisine.
3. Demonstrate safe food handling techniques.
4. Forecast and plan food pricing strategies for sales.
5. Manage and supervise food production area in food service operations.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	-	L	M	H	H	H	M	M	M	M	H	M	L	M
CLO 2	-	-	-	-	L	L	-	M	M	M	H	M	L	M
CLO 3	M	M	L	L	M	L	-	M	H	M	M	M	L	M
CLO 4	M	L	-	L	H	H	M	M	H	M	H	M	L	M
CLO 5	M	M	L	L	-	L	M	M	M	M	H	M	L	M

Hospital Dietary Food Service Management

Semester II
21PDND12

Hours of instruction per week: 5
No. of credits: 4

Course Objectives:

1. Gain knowledge on principles of management.
2. Develop skills in administration of dietary department.
3. Attain knowledge in maintaining the various records in food service institutions.

	Hours
Unit I Management in hospital dietary food service	12
Theories of management, Principles of management, Management by objectives, Role of administrative dietitian.	
Unit II Managerial Functions in hospital dietary department	18
Planning - Types, steps and importance. Forecasting. Organization – Types, organization charts in dietary food service. Personnel management - Manpower planning, staffing, training, motivation, Welfare policies and labour laws, human relations in dietary food service. Effective utilization of resources. Waste management in dietary department.	
Unit III Tools of management	16
Job analysis, work simplification techniques, job description, job specification, leadership, communication, direction, motivation, delegation, decision making. Professional ethics in hospital food service.	
Unit IV Quality management	12
Total quality management, Quality control, Management Information System, SWOT analysis in hospital food service	
Unit V Financial Management, Marketing and Sales Promotion	17
Costing and budgeting, pricing policy, food and beverage cost control. Food costs, labour costs, overhead costs, Break-even Analysis, maintenance of accounts. Marketing-Need and scope, Marketing segmentation, marketing mix, e-marketing, Advertising, merchandising and sales promotion techniques.	
Total Hours	75

Text Books:

1. **Reynolds, D. (2013)**, Onsite Food service Management- A best practices approach John Wiley and Sons, Inc.
2. **Ball.S., Jones .P ., Kirt .D. (2004)**, Lockwood .A., Hospitality Operations A Systems Approach, Thomson Learning .
3. **Shring Y, P. (2001)**, Effective Food Service Management, Anmol publications Pvt Ltd, New Delhi.

Reference Books:

1. **June Payne-Palacio, Monica (2016)**,Theis Food service Management: Principles and Practices, 13th Edition Pub. Harlow: Pearson.
2. **Mary B. Gregoire (2015)**, Food Service Organizations: A Managerial and Systems Approach, Prentice Hall.
3. **Barrows,W.C,Powers,T, Reynolds,D.R(2012)**, Study Guide to accompany Introduction to Management in the Hospitality Industry, John Wiley and Sons.
4. **Walker. J.R., (2006)**, Introduction to Hospitality Management, Dorling Kindersley (India) Pvt.Ltd.

Journals:

1. International Journal of Hospitality Management.
2. Journal of Hospitality Management and Tourism.
3. International Journal of Contemporary Hospitality Management.

Websites:

1. <http://www.neigrihms.gov.in/dietary.html>
2. <https://ijhpr.biomedcentral.com/>
3. <https://onlinelibrary.wiley.com/>

Course Learning Outcomes:

1. Acquire knowledge on the principles and functions of hospital dietary food service
2. Manage and control resource for diet production and service.
3. Supervise the dietary depart and food service area in hospital.
4. Implement quality standards in hospital dietary departments.
5. Ensure safety of patients and employees at workplace.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	-	M	H	H	L	L	M	M	M	H	M	H	M	H
CLO 2	-	M	-	-	M	M	L	M	M	-	M	H	M	H
CLO 3	H	M	H	-	L	M	L	M	M	-	M	H	M	H
CLO 4	H	M	-	H	M	L	L	M	M	H	M	H	M	H
CLO 5	H	M	H	-	L	L	L	M	M	-	M	H	M	H

Patient Counselling Techniques

Semester II
21PDNDE1a

Hours of instruction per Week: 4
No. of credits: 2

Course Objectives:

1. Gain knowledge on counselling process.
2. Know different methods of counselling.
3. Impart skill for patient counseling.

	Hours
Unit I Introduction to Counselling Meaning and definition, Characteristics of a counselor -Characteristics of a client- Stages of counselling - Ethical guidelines	9
Unit II Basic skills of Counselling Listening-Responding-Reflection – Questioning – Para – Phrasing – Summarizing-Empathy-Unconditional Positive Regard- Genuineness- Congruence	11
Unit III Advanced skills in Counselling Immediacy – Confrontation-Reflection Of Meaning – Interpretation/Reframing- Information Giving – Encourages-Self-Disclosure-Role Play – Resistance-Transference and Counter Transference	15
Unit IV Counselling process Rapport and Relationship Building-Assessment/Problem Definition-Goal Setting-Initiating-Intervention-Termination-Follow-up	11
Unit V Dietetic counselling Meaning – Definition-Dietitian as a skilled helper-Continuum of control-Developing a personal philosophy-Portrait of a dietitian using counselling skill-Qualities of dietician- Developing a counselling approach	14
Total Hours	60

Text Books:

1. **Judy Gable (2016)**, Counselling skills for dietitians, 2nd Edition, Blackbail Publications.
2. **Soundarrajan, R. (2012)**,Counselling - Theory, Skills and Practice, Tata McGraw Hill Publications.
3. **Lewis E. Patterson (2000)**, The Counselling Process, 5th Edition, Wadsworth, USA.

Reference Books:

1. **Richard Nelson-Jones(2021)**,Basic Counselling Skills: A Helper's,4th Edition, SAGE Publications India Pvt Ltd.
2. **GPH Panel of Experts (2018)**,Counselling Psychology Notes, Gullybaba Publishing House (P) Ltd.

Websites:

1. <https://basicmedicalkey.com/patient-counselling-settings-and-techniques/>
2. <https://fadic.net/>
3. www.medpub.com

Course Learning Outcomes:

1. Acquire knowledge on counselling skills.
2. Apply technical skills and tools in professional Counselling.
3. Offer personalized diet counselling based on patient needs.
4. Educate community on good health practice.
5. Create innovative counselling technique for individual and population groups.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	L	M	H	-	-	M	M	M	L	H	L	L	H
CLO 2	M	M	H	M	-	-	M	M	H	L	-	L	L	M
CLO 3	M	M	L	L	M	H	M	M	H	L	-	M	M	H
CLO 4	M	L	M	H	-	-	M	M	H	L	M	M	M	H
CLO 5	M	L	-	-	M	H	M	M	H	L	M	L	L	M

Diabetes Counselling

Semester II
21PDNDE1b

Hours of instructions per week: 4
No. of Credits: 2

+

Course Objectives:

1. Understand diabetes as a common lifestyle disorder and promote measures for prevention.
2. Help diabetics to manage their disease condition effectively through counselling.
3. Relate dietary management and lifestyle counselling.

	Hours
Unit I Introduction to Diabetes	12
Diabetes- Definition, types, etiology, risk factors, symptoms. Complications – micro and macro vascular, clinical findings, diagnosis, metabolic derangements, tests to identify prediabetes, IGT and diabetes.	
Unit II Management of Diabetes or Medical Nutrition Therapy	15
Management – Drug therapy – Type of insulin, mode of action. Diet – CHO restriction, role of fibre food exchange lists, glycemic index. Exercise – Importance and need, types. SMBG – Self Monitoring of Blood Glucose, instruments, method	
Unit III Screening of Diabetics	15
Nutritional screening – anthropometry, clinical assessment, diet surveys- need, importance and methods. Biochemical estimation – Fasting, post prandial, random blood glucose levels, OGTT, urea creatinine and other estimations	
Unit IV Diet Counselling	10
Calorie restriction, menu planning, low glycemic index foods, complex CHO, fibre rich foods, model diet plans.	
Unit V Lifestyle Counselling	8
Weight management – exercise, yoga Stress management – positive therapy.	
Total Hours	60

Text Books:

1. **Marcia NahikianNelms, (2016)**, Medical Nutrition Therapy: A Case-Study Cengage Learning Boston, USA.
2. **Soundarrajan, R. (2012)**,Counselling - Theory, Skills and Practice, Tata McGraw Hill Publications.
3. **Mahan, L.K. and Stump, S.E., (2010)**, Krause’s Food, Nutrition and Diet Therapy 11th Edition, W.B. Sunders Co.

Reference Books:

1. **Judy Gable (2016)**, Counselling skills for dietitians, 2nd Edition, Blackbail Publications.
2. **Lewis E. Patterson (2000)**, TheCounselling Process, 5th Edition, Wadsworth, USA.

Journals:

1. Indian Journal of Nutrition and Dietetics ,Published by Avinashilingam University
2. American Journal Dietetics Association, USA.
3. Australian Journal of Nutrition Dietetics, Australia.
4. Diabetology.
5. Diabetes care.

Websites:

1. https://care.diabetesjournals.org/content/40/Supplement_1/S33
2. <https://www.diabetes.co.uk/>
3. <https://pubmed.ncbi.nlm.nih.gov/30980161/>

Course Learning Outcomes:

1. Understand the importance and principles of dietetics in the management of diabetes.
2. Identify sign and symptoms of diabetes.
3. Plan customized diabetic diet.
4. Counsel diabetic patient on healthy dietary and life style modification.
5. Work as diabetic educator in hospital sector.

CLO / PLO	PLO 1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PSO1	PSO2	PSO3
CLO 1	H	M	-	M	M	L	M	M	M	M	M	H	-	M
CLO 2	-	M	-	M	M	-	L	H	H	L	M	H	-	M
CLO 3	-	M	M	-	M	-	L	-	H	M	M	H	-	-
CLO 4	H	M	-	-	M	L	L	-	H	M	M	H	M	M
CLO 5	H	-	H	H	M	L	-	H	L	L	M	H	-	H