UNIVERSITY OF DELHI

Department of Home Science

Faculty of Science

Peer Reviewed Post Graduate Programmes

Course Credit Structure-CBCS

2019

The Department of Home Science offers the following Post Graduate Programmes:

Masters Programmes in –

M.Sc. Food & Nutrition

M.Sc. Human Development & Childhood Studies

M.Sc. Development Communication & Extension

M.Sc. Resource Management & Design Application

M.Sc. Fabric & Apparel Science

Post Graduate Diploma Programmes in-

Post Graduate Diploma in Dietetics & Public Health Nutrition

Post Graduate Diploma in Health and Social Gerontology

POST GRADUATE DIPLOMA IN DIETETICS AND PUBLIC HEALTH NUTRITION

Department of Home Science

University of Delhi

Peer Reviewed Course Credit Structure-CBCS

2018

The Department of Home Science offers Post Graduate Diploma in Dietetics and Public Health Nutrition. The aim is to train a cadre of professionals who would work as dieticians, nutrition consultants and public health nutritionists.

The PGDDPHN programme is a one-year course divided into two-semesters. A student is required to complete 50 credits for the completion of course and the award of degree. A three month internship in a tertiary, multispeciality, minimum hundred bedded hospital with a Dietetics department is compulsory at the end of the course, for successful completion and for award of Diploma by the University.

Programme Specific Objectives:

1. To understand fundamentals of human physiology, food microbiology and nutritional biochemistry in relation to health and disease.
2. To develop understanding about nutrition in disease management, its prevention through various government programmes and policies.
3. To develop skills in food management for entrepreneurship.
4. To apply acquired skills in diet therapy, food service management, nutrition/health education and scientific writing.
5. To apply the principles of medical nutrition therapy and food service management in a hospital set up.

Programme Specific Outcomes:

This programme will enable the students to:

1. Comprehend the principles of human physiology and biochemistry for understanding the human diseases and their management.
2. Acquire knowledge on nutritional programmes and policies of the government.
3. Acquire skills for development of diet therapy and establishment of food service units.
4. Work as nutrition consultants and dieticians in hospitals and wellness centres.

COURSE CREDIT SCHEME FOR DIPLOMA PROGRAMME

Total Credits: 50
Total No. of Core Papers: 08
Total No. of Electives: 02

Semester	Core Courses			Elective Course			Total Credits
	No. of papers	Credits (L+T/P)	**Total Credits**	No. of papers	Credits (L+T/P)	**Total Credits**	
I	4	16 L + 5 T/P	**21**	1	4 L	**4**	**25**
II	4	14 L + 5 T/P	**19**	1	4 L+ 2 P	**6**	**25**
Total Credits for the Course		30L +10 T/P	**40**			**10**	**50**

SEMESTER I				
Core courses	Credits in each core course			
	Theory	Practical	Tutorial	Credits
Core course 1 DDPHNCC 101: Advanced Nutrition	4			4
Core course 2 DDPHNCC 102: Therapeutic Nutrition	4	2		6
Core course 3 DDPHNCC 103: Public Health Nutrition	4	2		6
Core course 4 DDPHNCC 104: Human Physiology	4		1	5
Elective course I	4			4
Total credits in Semester I				**25**

Elective Courses: Select any one of the following:

- DDPHNEC 11-Nutrition Communication & Counseling
- DDPHNEC 12-Sports Nutrition & Fitness

SEMESTER II				
Core courses	Credits in each core course			
	Theory	Practical	Tutorial	Credits
Core course 5 DDPHNCC 205: Clinical Nutrition	4	2		6
Core course 6 DDPHNCC 206: Institutional & Hospital Food Management	4	2		6
Core course7 DDPHNCC 207: Nutritional Biochemistry	4		1	5
Core course 8 DDPHNCC 208: Seminar and Scientific Writing	2			2
Elective course 2	4	2		6
Total credits in Semester II				**25**

Elective Courses: Select any one of the following:

- DDPHNEC 23- Food Microbiology & Food Safety
- DDPHNEC 24-Policies and Programmes in Public Health Nutrition

SEMESTER I

SEMESTER I				
Core courses	Credits in each core course			
	Theory	Practical	Tutorial	Credits
Core course 1 DDPHNCC 101: Advanced Nutrition	4			4
Core course 2 DDPHNCC 102: Therapeutic Nutrition	4	2		6
Core course 3 DDPHNCC 103: Public Health Nutrition	4	2		6
Core course 4 DDPHNCC 104: Human Physiology	4		1	5
Elective course I	4			4
Total credits in Semester I				**25**

Elective Courses: Select any one of the following:

- DDPHNEC 11-Nutrition Communication & Counseling
- DDPHNEC 12-Sports Nutrition & Fitness

DDPHNCC 101: ADVANCED NUTRITION
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:
To understand the biological role of different nutrients, their requirements and link these to optimal growth and development. To gain knowledge about the different methods which can be used to improve diet quality

Course Learning Outcomes:
Student will be able to -

1. Understand the biological role of and sensitive methods for deriving the requirements for specific nutrients
2. Understand critical periods in growth and development and impact of malnutrition
3. Appreciate implications of poor dietary and lifestyle practices
4. Appreciate importance of nutrition immunity interactions and their operational implications
5. Comprehend the methods by which diet quality can be improved

CONTENTS **PERIODS**

UNIT I: Human Nutrient Requirements **20**

- Historical perspective of nutrient requirements, terms used

- Methods of assessment of nutrient needs – a critical review
- Biological role, sensitive methods for derivations of requirements and recommended dietary allowances of specific nutrients
    - Energy
    - Carbohydrates and dietary fibre
    - Proteins and amino acids
    - Lipids and fatty acids
    - Water
    - Fat and water soluble vitamins
    - Minerals
- Critical evaluation of national and international nutrient allowances; factors affecting the requirements.

UNIT II: Growth and Development through the Life Cycle 10

- Determinants of growth and development
- Changes in body composition throughout the life cycle
- Impact of altered nutrition on growth and development
- Maternal malnutrition and pregnancy outcome
- Malnutrition and cognitive development
- Changing trends in life style and dietary patterns in population groups and their implications on nutritional status and disease

UNIT III: Interactions of Nutrition, Immunity and Infection 8

- Host defense mechanisms and nutrients essential in the development of immune system
- Effect of infections on the nutritional status of an individual
- Nutrient deficiencies and excesses affecting the immuno-competence and susceptibility to infections
- Operational implications

UNIT IV: Improving Diet Quality 10

- Measurement of diet quality
- Methods of improving nutrient content and bioavailability -fortification, GM foods, dietary diversity, home based solutions
- Measurement of protein quality, factors affecting and methods of improving protein quality
- Critical evaluation of national and international dietary guidelines
- Functional foods and bioactive substances, Nutraceuticals, Nutrigenomics

Suggested Readings:

- Bamji, M.S., Krishnaswamy K. Brahmam G.N.V. Eds. (2017)*Textbook of Human Nutrition*. 4th Edition. New Delhi **:**Oxford and IBH Publishing Co. Pvt. Ltd.
- Cameron N. (2002)*Human Growth and Development*. USA**:** Academic Press, Elsevier Science.

- Chadha R., Mathur P. Eds. (2015)*Nutrition: A Lifecycle Approach*. New Delhi**:** Orient Blackswan.
- FAO/WHO. (2004) *Vitamin and Mineral Requirements in Human Nutrition*. Report of a Joint Expert Consultation.
- FAO/WHO/UNU (2004)*Human Energy Requirements*. Report of a Joint Expert Consultation. Rome.
- FAO/WHO/UNU (2007)*Protein and Amino acid Requirements in Human Nutrition.*Report of a joint WHO/FAO/UNU expert consultation WHO Technical Report Series 935. Geneva**:** WHO.
- ICMR (2010)*Nutrient Requirements and Recommended Dietary Allowances for Indians* and its revised documents. New Delhi. ICMR.

Teaching Plan:

Week 1: Historical perspective of nutrient requirements and definitions, critical overview of methods of assessing requirements, derivation of energy requirements

Week 2: Biological role and sensitive methods for derivation of requirements of carbohydrates and fats

Week 3: Biological role and sensitive methods for derivation of requirements of protein, vitamins D, E, K

Week 4: Biological role and sensitive methods for derivation of requirements of vitamin A, Thiamin, Riboflavin

Week 5: Biological role and sensitive methods for derivation of requirements of Niacin, Pyridoxine, Folic acid, vitamin B12

Week 6: Biological role and sensitive methods for derivation of requirements of Calcium, Iron, Zinc, and other trace minerals

Week 7: Determinants of growth and development, changes in body composition through lifecycle and impact of alterations on health

Week 8: Impact of malnutrition on pregnancy outcome, cognitive development, impact of nutrition transition on health

Week 9: Host defence mechanisms, impact of infection on nutritional status and of malnutrition on immunity

Week 10: Operational implications of relationship between nutrition and immunity, measurement of diet quality, dietary diversity, home based solutions, fortification

Week 11: Nutrigenomics, Functional foods and Nutraceuticals

Week 12: Dietary guidelines –critical overview, protein quality – assessment, factors affecting and improvement

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Understand the biological role of nutrients and sensitive methods for deriving requirements	Discussion, PowerPoint presentations, Videos of methods of assessment	Class Quiz, Assignment
2.	Understand critical periods in growth and development and impact of malnutrition	Reading of research on impact of malnutrition on growth, discussion of findings of classical studies, Power Point presentations	Class quiz
3.	Appreciate importance of nutrition immunity interactions and their operational implications	Power Point presentation, discussion on classical studies on link of nutrition and immunity	Presentations by students on operational implications
4.	Comprehend the methods by which diet quality can be improved	Power Point presentations, Discussion, Videos on genetic modification, nutrigenomics	Assignment on measurement of diet quality, Assignment on market survey of nutraceuticals available

DDPHNCC 102: THERAPEUTIC NUTRITION
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:
To understand the etiology, pathophysiology and metabolic anomalies of various diseases/ disorders and provide appropriate nutrition care for its prevention and treatment

Course Learning Outcomes:
Student will be able to-

1. Gain knowledge about the importance of nutritional assessment in the care of patients.
2. Understand the etiology, physiological and metabolic anomalies of various acute and chronic disorders / diseases.

3. Learn the effect of various disorders on nutritional status, nutritional and dietary requirements.
4. Provide medical nutritional therapy for the prevention and treatment of various diseases/ disorders.

CONTENTS **PERIODS**

UNIT I: Nutritional Assessment and Care of Patients **8**

- Nutrition care process
  - Nutrition care process
  - Nutritional screening and assessment of patients – out patient & hospitalized
  - Tools for screening
  - Nutritional interpretation of routine medical and laboratory data
  - Nutrition care plan and implementation
  - Monitoring and follow up
  - Ethical issues
- Dietary counselling
- Nutrition Support**:**Enteral nutrition

UNIT II: Medical Nutrition Therapy for Weight Management and Metabolic Disorders **16**

- Obesity and underweight
- Eating disorders
- Diabetes mellitus – Type 1, Type 2 and Gestational diabetes
- Inborn disorders of metabolism (PKU, Galactosemia and MSUD)
- Gout

UNIT III: Coronary Heart Diseases **12**

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counselling and recent advances in:

- Hypertension, dyslipidemia, atherosclerosis, metabolic syndrome, Congestive heart failure
- Cerebrovascular disease and peripheral vascular disease

UNIT IV: Gastrointestinal Tract Disorders **12**

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counselling and recent advances in:

- Upper and lower gastrointestinal disorders
- GERD, peptic ulcer, dumping syndrome, irritable bowel syndrome
- Lactose intolerance, celiac disease, inflammatory bowel disease
- Hemorrhoids

Suggested Readings:

- Mahan, L. K. and Escott Stump. S. (2016) *Krause's Food & Nutrition Therapy* 14th ed. Saunders-Elsevier.
- Joshi Y K. (2008) *Basics of Clinical Nutrition* 2nd ed. Jaypee Brothers Medical Publishers.

- Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in Health and Disease*. 10thed. Lipincott, William and Wilkins.
- Gibney MJ, Elia M, Ljungqvist & Dowsett J. (2005*) Clinical Nutrition. The Nutrition Society Textbook Series*. Blackwell Publishing Company.
- Garrow, J.S., James, W.P.T. and Ralph, A. (2000) *Human Nutrition and Dietetics*. 10th ed. Churchill Livingstone.Williams, S.R. (2001) *Basic Nutrition and Diet Therapy*. 11th ed. Times Mirror Mosby College Publishing.

Teaching Plan:

Week 1: Nutrition care process and steps of NCP
Week 2: Dietary Counselling, Enteral Nutrition
Week 3: Medical Nutrition Therapy in Obesity
Week 4: Medical Nutrition Therapy in Underweight, Eating disorders
Week 5: Medical Nutrition Therapy in Diabetes mellitus**:** type1 and type 2 diabetes
Week 6: Medical Nutrition Therapy in Diabetes mellitus**:** GDM, Gout
Week 7: Etiopathophysiology, metabolic & clinical aberrations, diagnosis, Complications and recent advances in prevention, treatment, MNT and dietary counseling in Hypertension, dyslipidemia, atherosclerosis
Week 8: Etiopathophysiology, metabolic & clinical aberrations, diagnosis, Complications and recent advances in prevention, treatment, MNT and dietary counseling in Metabolic syndrome, congestive heart failure
Week 9: Etiopathophysiology, metabolic & clinical aberrations, diagnosis, Complications and recent advances in prevention, treatment, MNT and dietary counseling in Peripheral and cerebrovascular disease
Week 10: Etiopathophysiology, metabolic & clinical aberrations, diagnosis, Complications and recent advances in prevention, treatment, MNT and dietary counseling in GERD, peptic ulcer, dumping syndrome
Week 11: Etiopathophysiology, metabolic & clinical aberrations, diagnosis, Complications and recent advances in prevention, treatment, MNT and dietary counseling in Irritable bowel syndrome, lactose intolerance, celiac disease Complications and MNT and dietary counseling in
Week 12: Inflammatory bowel disease, hemorrhoids, inborn diseases of metabolism, gout

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Gain knowledge about the importance of nutritional assessment in the care of patients.	Discussion	Assignment on nutritional assessment and care of patients.
2.	Understand the etiology, physiological and metabolic anomalies of various acute and	Discussion	Assignment on etiology, pathophysiology and metabolic changes in various

	chronic disorders / diseases.		disorders
3.	Learn the effect of various disorders on nutritional status, nutritional and dietary requirements.	Discussion	Assignment on nutritional status
4.	Provide medical nutritional therapy for the prevention and treatment of various diseases/ disorders	Discussion	Assignment on role of diet in prevention and management of the diseases/ disorders

DDPHNCC 102: THERAPEUTIC NUTRITION PRACTICAL

Marks: 50 **Duration: 3 Hrs.**

Course Objectives:

To perform nutritional assessment of patients, plan and prepare suitable therapeutic diets based on patient needs and provide dietary counseling for prevention/ treatment of various diseases/ disorders.

Course Learning Outcomes:

Student will be able to-

1. Perform nutritional assessment of patients
2. Plan and prepare suitable therapeutic diets based on patient needs
3. Provide dietary counseling for prevention/ treatment of various diseases/ disorders

CONTENTS **PERIODS**

UNIT I: **1**

- Assessment of patient needs – nutritional assessment and screening

UNIT II: **11**

- Planning and preparation of diets for following diseases
  - Obesity
  - Underweight
  - Type 1 diabetes
  - Type 2 diabetes
  - Gestational Diabetes
  - Hypertension and dyslipidemia
  - Congestive heart failure
  - Ulcerative colitis
  - Lactose intolerance
  - Celiac disease

Suggested Readings:

- Gibney MJ, Elia M, Ljungqvist&Dowsett J. (2005) *Clinical Nutrition*. The Nutrition Society Textbook Series. Blackwell Publishing Company.
- Gibson SR. (2005)*Principles of Nutritional Assessment*. 2nd ed. Oxford University press.
- Joshi YK. *Basics of Clinical Nutrition*. 2nd ed.Jaypee Brothers Medical Publishers.
- Lee RD & Neiman DC. (2009)*Nutritional Assessment*. 5th ed. Brown & Benchmark.
- Mahan, L. K. and Escott Stump. S. (2016) *Krause's Food & Nutrition Therapy* 14th ed. Saunders-Elsevier.
- Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in Health and Disease.* 10thed. Lipincott, William and Wilkins.
- Williams, S.R. (2001) *Basic Nutrition and Diet Therapy*. 11th ed. Times Mirror Mosby College Publishing.

DDPHNCC 103: PUBLIC HEALTH NUTRITION
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:

To familiarize the students with the concept of Public Health Nutrition and food security. It will also expose the students to the national health care delivery system. The students will acquire knowledge about the various methods of nutritional assessment and public health aspects of malnutrition.

Course Learning Outcomes:

Student will be able to -

1. Become familiar with the concept of public health nutrition.
2. Get exposure to the national healthcare delivery system.
3. Acquire knowledge about assessment of nutritional status of individuals and community.
4. Understand the public health aspects of malnutrition in the community.
5. Understand the concept of food and nutrition security.

CONTENTS **PERIODS**

UNIT I: Public Health Nutrition **10**

- Aim, scope and content of Public Health Nutrition
- Role of Public Health Nutritionist in National development
- Health – definition, dimensions, determinants and indicators
- National Nutrition Mission- maternal nutrition (antenatal and postnatal care)

UNIT II: Assessment of Nutritional Status of Individual and Community **12**

- Meaning and significance of nutritional status assessment
- Methods of nutritional assessment: Anthropometry, Biochemical and Biophysical methods, clinical methods, dietary intake and ecological variables including socio-cultural, biologic, environmental and economic, and vital health statistics
- Errors in methods of assessing nutritional status
- Rapid assessment procedures for community nutrition assessment

UNIT III: Public Health Aspects of Undernutrition 12

- Etiology, clinical features, public health implications, preventive strategies for:
  - Chronic Energy Deficiency/ Protein Energy Malnutrition and Severe Acute Malnutrition
  - Micronutrient deficiencies - Vitamin A deficiency, Nutritional Anemias, Iodine deficiency disorders, Vitamin D deficiency and Osteoporosis, Zinc Deficiency

UNIT IV: Public Health Aspects of Lifestyle related disorders 8

- Public Health implications and preventive strategies for: Obesity, Hypertension, Cardiovascular diseases, Diabetes

UNIT V: Food and Nutrition Security 6

- Concepts and definitions of food and nutrition security at the national, regional, household and individual levels
- Impact of food production, losses, distribution, access, availability, consumption on food and nutrition security

Suggested Readings:

- *Community based Management of children with severe acute malnutrition, Operational & Technical guidelines* (2012) Ministry of health & Family Welfare, NirmanBhawan, New Delhi
- Indian Council of Medical Research: Dietary Guidelines for Indians. (2011)*Dietary Guidelines for Indians: A manual* (2nd ed.) second edition , NIN.
- Gibney, M.J., Margetts, B.M., Kearney, J.M. Arab, I. (Eds.) (2004)*Public Health Nutrition*. NS Blackwell Publishing.
- Longvah T, Ananthan R, Bhaskarachary K, Venkaiah K (2017) *Indian food composition tables*. National Institute of Nutrition.
- Jelliffe, D. B., &Jelliffe, E.F.P. (1989)*Community Nutritional Assessment*. Oxford University Press.
- *Management of SAM children through medical nutrition therapy* (2009) Vol I & II. National Consensus Workshop. Published by DBT. Ministry of Science & Technology. Government of India and ICMR, New Delhi
- Owen, A.Y,&Frankle, R.T. (1986)*Nutrition in the Community: The Art of Delivering Services* (2nd ed.) Times Mirror/Mosby.
- Park, K. (2017) *Park's Textbook of Preventive and Social Medicine*. 24th ed. Jabalpur M/s. Banarsidas Bhanot.
- Ross, A.C. (2012) *Nutrition in health and disease*. (Eds) Lippincott Williams & Wilkins.
- Shils, M.E. (1998) *Nutrition in health and disease*. (Eds) Lippincott Williams & Wilkins.

- Vir, S. (2011) *Public health nutrition in developing countries Part-1 & 2*. Woodhead Publishing India limited.
- Wadhwa, A. & Sharma, S. (2003) *Nutrition in the Community*. A text book.
- SCN News, UN ACC/SCN Subcommittee on Nutrition.
- WHO (2006) *WHO Child growth standards: Length/height for age, weight for age, weight for length, weight for height and body mass index* (2006). Available at http:// www.who.int.
- WHO (2007) *WHO Reference Data for Children and Adolescents (5-19 years).* WHO reference. Available at http://www.who.int/growthref/en/
- WHO (2009) *WHO Child growth standards: Growth velocity based on weight, length and head circumference* Available at http://www. who.int
- *WHO child growth standards and identification of severe acute malnutrition in infants and children*, Joint statement - Child Growth Standards for SAM children (2009)
- *WHO Guidelines for Inpatient treatment for SAM child* (2003) Available at http://www.who.int/nutrition/publications/severemalnutrition/9241546093/en/

Teaching Plan:

Week 1: Concept of public health nutrition, Aim and scope of Public Health Nutrition
Role of Public Health Nutritionist in National developmentHealth - definition, dimensions

Week 2: Health - determinants and indicators, Health care of the community

Week 3: Health care systems, Meaning and significance of nutritional status assessment
Methods of nutritional assessment**:** Anthropometry

Week 4: Methods of nutritional assessment**:** Biochemical and Biophysical methods, clinical methods, dietary intake

Week 5: Methods of nutritional assessment**:** ecological variables including socio-cultural, biologic, environmental and economic, and vital health statistics
Errors in methods of assessing nutritional status

Week 6: Rapid assessment procedures for community nutrition assessment
Etiology, clinical features, public health implications, preventive strategies for**:** Chronic Energy Deficiency/ Protein Energy Malnutrition and Severe Acute Malnutrition

Week 7: Etiology, clinical features, public health implications, preventive strategies for**:** Severe Acute Malnutrition, Vitamin A deficiency, Nutritional Anemias

Week 8: Etiology, clinical features, public health implications, preventive strategies for**:** Nutritional Anemias, Iodine deficiency disorders

Week 9: Etiology, clinical features, public health implications, preventive strategies for**:** Vitamin D deficiency and Osteoporosis, Zinc Deficiency
Public Health implications and preventive strategies for**:** Obesity

Week 10: Public Health implications and preventive strategies for**:** Hypertension, Cardiovascular diseases

Week 11: Public Health implications and preventive strategies for**:** Diabetes
Food and Nutrition Security**:** Concepts and definitions of food and nutrition security at the national, regional, household and individual levels

Week 12: Impact of food production, losses, distribution, access, availability, consumption on food and nutrition security

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching And Learning Activity	Assessment Tasks
1.	Become familiar with the concept of public health nutrition. Get exposure to the national healthcare delivery system.	Lecture-cum-Discussion	Assignment/ Test
2.	Acquire knowledge about assessment of nutritional status of individuals and community.	Lecture-cum-Discussion, Demonstration	Assignment/ Test
3.	Understand the public health aspects of malnutrition in the community.	Lecture-cum-Discussion	Student Presentations/ Assignment/ Test
4.	Understand the concept of food and nutrition security	Lecture-cum-Discussion	Assignment/ Test

DDPHNCC 103: PUBLIC HEALTH NUTRITION PRACTICAL

Marks: 50 **Duration: 3 Hrs.**

Course Objectives:

To acquire skills in nutritional assessment, plan and prepare low cost nutritious dishes and menus for vulnerable groups, plan and prepare low cost nutritious dishes and menus for PEM and become familiar with the national health care delivery system

Course Learning Outcomes:

Student will be able to-

1. Acquire skills in nutritional assessment
2. Plan and prepare low cost nutritious dishes and menus for vulnerable groups
3. Plan and prepare low cost nutritious dishes and menus for PEM
4. Understand the policies and programmes under the National Nutrition Mission

CONTENTS **PERIODS**

UNIT 1: **3**

- Assessment of nutritional status – diet survey, anthropometry, clinical

UNIT II: **3**

- Rapid assessment procedures – focus group discussions, in-depth interviews, mapping to study health behavior, food habits and dietary patterns

UNIT III: **2**

- Planning and preparation of diet for PEM

UNIT IV: **3**

- Development of low cost recipes for infants and preschoolers

UNIT V: **1**

- Field visit to Antenatal Care Centres (Primary Health Centre)

Suggested Readings:

- Indian Council of Medical Research: Dietary Guidelines for Indians (2011)*Dietary Guidelines for Indians: A manual*. Second edition, National Institute of Nutrition.
- Longvah T, Ananthan R, Bhaskarachary K, Venkaiah K (2017) *Indian food composition tables*. National Institute of Nutrition.
- WHO (2006) *WHO Child growth standards: Length/height for age, weight for age, weight for length, weight for height and body mass index* (2006). Available at http:// www.who.int.
- WHO (2007) *WHO Reference Data for Children and Adolescents (5-19 years).* WHO reference. Available at http://www.who.int/growthref/en/
- WHO (2009) *WHO Child growth standards: Growth velocity based on weight, length and head circumference* Available at http://www.who.int
- Khanna, K, Gupta, S, Sethi, R, Mahna, R,Rekhi, T (2004) *The Art and science of cooking-A Practical Manual*. Elite Publishing House Pvt. Ltd.
- Chadha R, Mathur, P(2015) *Nutrition A life cycle Approach*. Orient BlackSwan Pvt. Ltd., Lady Irwin College.
- Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010) *Basic food preparation*. (4th ed.) Lady Irwin College.

DDPHNCC 104: HUMAN PHYSIOLOGY
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:

To understand the normal functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases

Course Learning Outcomes:

Student will be able to -

1. Understand the current state of knowledge about the functional organization of the human body.
2. Develop insight of normal functioning of all the organ systems of the body and their interactions.
3. Comprehend the pathophysiology of commonly occurring diseases.
4. Correlate physiology with various disorders and their pathogenesis.

CONTENTS **PERIODS**

UNIT I: Blood and Cardio-Thoracic Physiology **16**

- Blood and Plasma Protein -Composition and Function
- Blood formation and factors controlling Erythropoiesis
- Pathophysiology of Anaemia and Jaundice
- Cardiac cycle, Cardiac output,Heart sounds
- Heart rate & regulation
- Blood pressure, Hypertension
- Coronary Artery Disease
- Hemorrhage; Compensatory changes after hemorrhage
- Transport and exchange of gases
- Control of Respiration and Respiratory function tests
- Lung volume & Capacities and COPD

UNIT II: Excretory Physiology and Exercise Physiology **8**

- Urine formation
- Renal function tests
- Acid Base balance
- Pathophysiology of Renal Stones, Urinary Tract Infection, Glomerulonephritis
- Concept of Fitness, Adaptations to exercise
- Energy Metabolism in Sports
- Overview of Diet and Physical Performance

UNIT III: Gastrointestinal Physiology **12**

- Functions of Stomach, Liver, Pancreas and Gall Bladder
- Composition ,function and regulation of :
  - Salivary juice
  - Gastric juice
  - Pancreatic juice
  - Bile juice
  - Intestinal juice
  - GI hormones
- Pathophysiological overview of some common diseases in relation to Gastrointestinal Tract (Peptic ulcer/GERD, Cholelithiasis, Portal Hypertension, Fatty liver and Liver Cirrhosis

UNIT IV: Neuro-Endocrine and Reproductive Physiology **12**

- Overview of organization of nervous system
  - Effects of Pituitary, Thyroid, Parathyroid, Adrenal and Pancreatic hormones
  - Pathophysiology of Diabetes Mellitus, Metabolic Syndrome, Hashimoto's disease. Tetany and Cushing Syndrome
  - Physiology of Menstruation and Menopause
  - Physiology of Ageing
  - Physiology of Pregnancy, Lactation
  - Pathophysiology of PCOD and Infertility

UNIT V: Clinical Physiology **12**

- Evaluation/Interpretation of various physiological parameters in health and disease through simulated patient case profiles and case studies

Suggested Readings:

- Ganong W.F (2003) *Review of Medical Physiology*.21st ed. McGraw Hill.
- Guyton A.C. and Hall J.E.(2000)*Textbook of Medical Physiology*.10th ed. India: Harcourt Asia..
- Tortora G.J and Grabowski S.R.(2000) *Principles of Anatomy and Physiology*.9th ed. John Wiley and Sons.Inc.
- West J.B (1996)*Physiological Basis of Medical Practice*.12th Edition. B. I. Waverly Pvt. Ltd.
- Marieb E.N(2001) *Human Anatomy and Physiology*(5th ed)Pearson Education ,Inc, publishing as Benjamin Cummings.
- Jain A. K (2014) *Human Physiology for BDS*(5^{th}ed), Publisher:Avichal Publishing Company; ISBN: 9788177394337
- Pal G.K and Pal Pravati(2016) *Comprehensive Textbook Of Medical Physiology* (2Vols) Publisher: Jaypee Brothers Medical Pub (P) Ltd.) ISBN: 5551234080758
- *Manual* of *Practical Physiology* for MBBS (2017) 5 edition; *JainA.K.Publisher*: Arya Publications, India
- *Text book of Practical Physiology* (2010) 3rd edition. Paul G.K. *Publisher*: Universities Press (India) Limited

- *Medical Laboratory Technology - a Procedure Manual for Routine Diagnostic Tests Vol. I* (2010) Mukherjee, K.L., Tata Mc Graw–Hill Publishing Company Limited (New Delhi). ISBN:9780070076594 / ISBN:9780070076631
- *Medical Laboratory Technology - a Procedure Manual for Routine Diagnostic Tests VoI. II* (2010) Mukherjee, K.L., Tata Mc Graw – Hill Publishing Company Ltd. (New Delhi), ISBN: 9780070076648

Teaching Plan:

Week 1: Blood and Plasma Protein -Composition and Function, Blood formation and factors controlling Erythropoiesis, Pathophysiology of Anaemia and Jaundice

Week 2: Cardiac cycle, Cardiac output ,Heart sounds, Heart rate & its regulation

Week 3: Blood pressure, Hypertension,Coronary Artery Disease, Haemorrhage, Compensatory changes after haemorrhage

Week 4: Transport and exchange of gases, Control of Respiration and Respiratory function test, Lung volume & Capacities and COPD

Week 5: Urine formation , Renal function tests, Acid Base balance, Pathophysiology of Renal stones, Urinary Tract Infection, Glomerulonephritis

Week 6: Concept of Fitness, Adaptations to exercise, Energy Metabolism in Sports, Overview of Diet and Physical Performance

Week 7: Functions of Stomach, Liver, Pancreas and Gall Bladder, Composition ,function and regulation of Salivary juice, Gastric juice

Week 8: Pancreatic juice, Bile juiceIntestinal juice; GI hormones

Week 9: Pathophysiological overview of some common diseases in relation to Gastrointestinal Tract**:** Peptic ulcer/GERD, Cholelithiasis, Portal Hypertension, Fatty liver and Liver Cirrhosis

Week 10: Overview of organization of nervous system, Physiology of Ageing

Week 11: Effects of Pituitary, Thyroid, Parathyroid, Adrenal and Pancreatic hormones, Pathophysiology of Diabetes Mellitus, Metabolic Syndrome, Hashimoto's disease,Tetany and Cushing Syndrome

Week 12: Physiology of Menstruation and Menopause, Physiology of Pregnancy, LactationPathophysiology of PCOD and Infertility,

Facilitating the Achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Understand the structural and functional organisation of Cardiothoracic System	Measurement of Pulse, BP and Oxygen Saturation	Recording of BP by using a Sphygmomanometer, Use of Pulse Oximeter
2.	Understand the structural and functional Organisation Of GIT	Study of permanent slides of GI organs	Histological features of Stomach, Small and Large intestine Liver

3.	Comprehend the Structural and Functional organization of Genitourinary System	Study of permanent slides of Genitourinary Tract, Renal Function tests	Histological features of Nephron and Kidney, Dipstick method of urine test for albumin and sugar, study of biochemical reports and interpretation with respect to RFT.
4.	Appreciate the structural and functional organization of Neuroendocrine System	Measurement of Blood Sugar	Use of Glucometer, HbA1c values Interpretation of OGTT
5.	Acquire skill set to analyse and interpret the physiological parameters of disease conditions in clinical/hospital set ups	Study of simulated case profiles of diseased conditions	Tests, quizzes

DDPHNEC 11: NUTRITION COMMUNICATION AND COUNSELLING THEORY

Marks : 100 **Duration: 3 Hrs.**

Course Objectives:
To understand the influence of counseling on disease management and identify components of counseling skills, impart knowledge of the processes of nutrition communication and counseling and provide skills of counseling for specific disease conditions.

Course Learning Outcomes:
Student will be able to -

1. Understand the importance of BCC in managing nutrition related problems
2. Draw out a complete counseling plan for individuals based on their physiological conditions using the appropriate tools
3. Understand how best to maintain adherence to changed dietary practices for specific physiological conditions
4. Gain knowledge on traditional and alternate methods to manage disorders

CONTENTS **PERIODS**

UNIT I: Basics of Diet Counseling **14**

- Concept and importance of counseling in the nutrition care process
- Traditional, Current and Emerging methods/tools of counseling
- Skills and attributes of a counselor
- Barriers to effective communication

- Understanding dietary patterns and food choices and their impact on counseling
- Behaviour Change Communication and Models for behaviour change
- Counseling strategies

UNIT II: Processes Involved in Dietary Counseling **8**

- Managing resources of the communicator/counselor
- Designing of counseling plans – goals & objectives, evaluation instruments.
- Implementation: facilitating self-management of disease condition
- Evaluation: evaluating adherence to dietary changes
- Counseling approaches after evaluation

UNIT III: Dietary Counseling through the Life Span **20**

- Considerations for counseling plans for:
  - Prenatal, antenatal and postnatal women
- Childhood nutrition problems like:
  - SAM, weight management, vitamin and mineral deficiencies
- School children, adolescents, young adults
  - Fitness, weight management, eating disorders, nutritional anemia
- Managing diet related chronic diseases in adults:
  - Obesity
  - Diabetes
  - Dyslipidemia
  - Hypertension
  - Cancer risk prevention
  - Renal disease
  - Liver disorders
- Geriatric counseling

UNIT IV: Nutritional/Medicinal Role of Traditional Foods, Traditional Food Beliefs **6**

- Role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management

Suggested Readings:

- Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier
- Snetselaar L. (2009).Nutrition Counseling Skills for the Nutrition Care Process. Fourth Ed. Sudbury, Massachusetts: Jones Bartlett Publishers.
- Holli B Betsy and Beto A Judith. (2014). Nutrition Counseling and Education Skills for Dietetics Professionals. Sixth edition. USA:Lippincot Williams and Wilkins; Wolters Kluwer.
- Gable J. (2016). Counseling Skills for dietitians. Florida, USA:JohnWiley and Sons.
- Midwinter R and Dickson J.(2015). Embedding Counseling and Communication Skills. A Relational Skills Model.Routledge
- Devito Joseph A. (2015) Human Communication: The Basic Course. New York:Pearson

- King K and Klawitter B.(2007). Nutrition Therapy. Advanced Counseling Skills. Third Edition. Philadelphia, USA:Lippincot Williams and Wilkins; Wolters Kluwer.
- http://www.fao.org/docrep/X2550E/X2550e04.htm
- WHO recommendations on antenatal care for positive pregnancy experience (2016)

Teaching Plan:

Week 1: Basics of Diet Counseling, Concept and importance of counseling in the nutrition care process, Traditional, Current and Emerging methods/tools of counseling

Week 2: Skills and attributes of a counselorBarriers to effective communication

Week 3: Understanding dietary patterns and food choices and their impact on counseling Behavior Change Communication and Models for behavior change

Week 4: Behavior Change Communication and Models for behavior change Counseling strategies;Processes involved in dietary counseling; Managing resources of the communicator/counselor

Week 5: Designing of counseling plans – goals & objectives, evaluation instruments. Implementation**:** facilitating self-management of disease conditionEvaluation**:** evaluating adherence to dietary changes

Week 6: Counseling approaches after evaluationConsiderations for counseling plans for**:**Prenatal and pregnant women

Week 7: Considerations for counseling plans for**:** Lactating women and Childhood nutrition problems like SAM, weight management, vitamin and mineral deficiencies

Week 8: Considerations for counseling plans for**:** School children, adolescents, young adults**:** fitness, weight management, eating disorders and Obesity

Week 9: Considerations for counseling plans for**:** Diabetes and dyslipidemia

Week 10: Considerations for counseling plans for**:**hypertension and cancer risk prevention

Week 11: Considerations for counseling plans for**:** renal disease, liver disorders and geriatric counseling

Week 12: Nutritional/medicinal role of traditional foods**:** traditional food beliefs, role of Ayurveda, Naturopathy, Yoga and other traditional medicines in and disease management

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	To understand the concept of BCC in nutrition	Discussion	Group discussions on theories of BCC
2.	Draw out a complete counselling plan for individuals based on their physiological conditions	Discussion on overall plan with case studies	Practical preparation of counselling plans for a hypothetical situation

	using the appropriate tools		
3.	Understand how best to maintain adherence to changed dietary practices for specific physiological conditions	Discussion on case studies for each condition	Student presentations and assignments, case studies
4.	To gain knowledge on traditional and alternate methods to manage disorders	Discussion	Group discussions on various alternate methods of medicine in India

DDPHNEC 12: SPORTS NUTRITION AND FITNESS
THEORY

Marks : 100 **Duration: 3 Hrs.**

Course Objectives:

To develop knowledge and skills of Sports Nutrition care integrated with other important aspects for recreational and competitive athletes and to develop concepts of components of fitness and skills required for assessment and improvement of physical fitness. It will also facilitate conceptual understanding and application of the energy systems, macro- and micro-nutrients, supplements and fluid recommendations for sports performance and develop critical analytical skills of athletes' nutritional needs with respect to phases of training and competition.

Course Learning Outcomes:

Student will be able to-

1. Exhibit knowledge of the components of fitness, its assessment and training for improvement.
2. Exhibit knowledge of the energy systems of exercise and its continuum in various sports.
3. Successfully plan, implement and monitor sport-specific diets for athletes through all age groups for recreational and competitive athletes.
4. Chalk out plans for provision of nutritional care to recreational and competitive athletes integrating diet plans with nutrition education/extension services and counselling to special groups of athletes.

CONTENTS **PERIODS**

UNIT I: Introduction to Physical Fitness and Sports Nutrition **10**

- Definition & components of physical fitness

- Methods of assessing physical fitness
- Approaches to achieving physical fitness through the life cycle
- Introduction to Sports nutrition
- Integrated approach to care for athletes

UNIT II: Energy Systems and Fuel for Exercise and Sports 10

- Energy systems for physical activity and sports
- Continuum of energy
- fuel utilization for different sports
- Target sports-diets , macro- and micro-nutrient recommendations for sports performance

UNIT III: Nutritional Recommendations for High Performance Athletes 20

- National Recommendations and nutritional guidelines for different categories of high performance sports
- Nutritional care for Training and day-today recovery
- Nutrition for the Pre-competition, Competition and post competition recovery phase
- Supplements in Sport :performance enhancing substances ,drugs, ergogenic aids and herbs in sports performance
- Nutrition for athletes with special needs: vegetarianism, special Olympics, Paralympics

UNIT IV: Weight Management in Sports 8

- Approaches to weight reduction, in weight category sports
- Gain in Lean Body Mass (LBM) for athletic performance
- Management of eating disorders in sports

Suggested Readings:

- ILSI, NIN &SAI. (2017)*Nutritional recommendations for high performance athletes*(2nd ed.).
- Joshi S. (2010)*Diet and Nutrition*. 1st ed, publishers Tata McGraw Hill.
- Mahan, L. K. and Escott Stump S. (2016)*Krause's Food & Nutrition Therapy*(14th ed.) Saunders-Elsevier.
- Hickson JF and Wolinksky I. (1997) *Nutrition for exercise and Sport* 2nd ed.CRC Press.
- Burke LM and Deakin V. (2002)*Clinical Sports Nutrition* 2nd edition, Publishers McGraw Hill.
- Dan Benardot. (2011)*Advanced Sports Nutrition*. (2nd ed.).
- Fink H H and Mikesky A E. (2017)*Practical Applications in Sports Nutrition* (5thed.).
- Bushman B. ACSM's *Complete Guide to Fitness & Health*.(2nd ed.) Published by ACSM.

Teaching Plan:

Week 1: Definition of physical fitness, Components of physical fitness, Methods of assessing physical fitness

Week 2: Approaches to achieving physical fitness through the life cycle, Introduction to Sports Nutrition

Week 3: Integrated approach to care for athletes, Energy systems in exercise and sport, Continuum of energy

Week 4: Fuel utilization for different sports
Week 5: Target sports-diets, macro- and micro-nutrient recommendations for sportsperformance
Week 6: National Recommendations and nutritional guidelines for different categories of high performance sports
Week 7: Nutritional care for Training and day-today recovery
Week 8: Nutrition for the Pre-competition, Competition and post competition recovery phase
Week 9: Supplements in Sport**:**performance enhancing substances ,drugs, ergogenic aids and herbs in sports performance
Week 10: Nutrition for athletes with special needs**:** vegetarianism, different types of Olympics
Week 11: Approaches to weight reduction, in weight category sports, Gain in LBM for athletic performance
Week 12: Management of eating disorders in sports

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Develop concepts of physical fitness and Sports Nutrition. Be aware of the components of physical fitness, skills in assessment and exercises to improve physical fitness	Various fitness exercises and assessments in groups	Assessment scores of partners' physical fitness, Test on the topic
2.	Exhibit knowledge of energy systems in sports, fuel for different sports	Demonstration, and discussion	Test on knowledge domain, Assessment using skills learnt-case study
3.	Develop in- depth understanding and critically evaluate and apply nutritional recommendations for different categories athletes and special needs, during various phases and a comprehensive view on supplements in Sport	Presentations, hand outs discussions and surveys	Class assignments, scrap books, survey reports and diet plans
4.	Gain comprehensive knowledge on the needs of weight management in sports and skills on how to manage it.	Discussion and case studies	Diet plans for athletes to manage their weight especially for weight category sports

SEMESTER II

SEMESTER II				
Core courses	Credits in each core course			
	Theory	Practical	Tutorial	Credits
Core course 5 DDPHNCC 205: Clinical Nutrition	4	2		6
Core course 6 DDPHNCC 206: Institutional & Hospital Food Management	4	2		6
Core course7 DDPHNCC 207: Nutritional Biochemistry	4		1	5
Core course 8 DDPHNCC 208: Seminar and Scientific Writing	2			2
Elective course 2	4	2		6
Total credits in Semester II				**25**

Elective Courses: Select any one of the following:

- DDPHNEC 23- Food Microbiology & Food Safety
- DDPHNEC 24-Policies and Programmes in Public Health Nutrition

DDPHNCC 205: CLINICAL NUTRITION
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:
To understand the etiology, physiological and metabolic anomaliesand provide appropriate nutrition care for prevention and treatment of various disorders / diseases

Course Learning Outcomes:
Student will be able to -

1. Develop a detailed understanding of the etiology, physiological and metabolic anomalies of various acute and chronic disorders / diseases.
2. Demonstrate competency in nutrition assessment and diet history interview skills
3. Develop understanding and expertise on the effect of various disorders on nutritional status, nutritional and dietary requirements.
4. Use critical thinking and clinical reasoning to develop nutritional care plan for prevention and treatment of various disorders / diseases.
5. Apply the knowledge to plan medical nutritional therapy for treatment of various disorders/ diseases.

CONTENTS **PERIODS**

UNIT I: Nutrition Care **4**

- Nutrition Support – Parenteral Nutrition

UNIT II: Hepatobiliary and Pancreatic Disorders **14**

- Etiopathophysiology, metabolic &clinical aberrations, Complications, treatment, MNT
- Nonalcoholic fatty liver disease (NAFLD), Cirrhosis, End stage liver disease (ESLD), Encephalopathy, Liver transplant; Cholecystitis, Cholelithiasis, Pancreatitis

UNIT III: Diseases of Heart and Blood Vessels **5**

- Etiopathophysiology, metabolic & clinical aberrations, complications, prevention, treatment and MNT
- Myocardial Infarction, angioplasty, heart transplant

UNIT IV: Metabolic Stress and Cancer **6**

- Metabolic & clinical aberrations, complications, treatment and MNT
- Metabolic Stress -Surgery, Burns and Sepsis, Cancer

UNIT V: Renal Disorders **16**

- Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in
  - Nephrotic Syndrome, Glomerulonephritis, Acute Renal Failure, Chronic Kidney Disease, End Stage Renal Disease (ESRD), Dialysis, Transplant, Renal Stones.

UNIT VI: Neurological Disorders **3**

- Etiopathophysiology, complication, prevention, treatment, MNT in
  - Alzheimer's disease, Parkinson disease

Suggested Readings:

- Mahan, L. K. and Escott Stump. S. (2016) *Krause's Food & Nutrition Therapy*. Saunders-Elsevier
- Joshi Y K.(2008) *Basics of Clinical Nutrition*. Jaypee Brothers Medical Publishers
- Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in Health and Disease*. (10th ed.)Lipincott, William and Wilkins.
- Gibney MJ, Elia M, Ljungqvist&Dowsett J. (2005) *Clinical Nutrition*. The Nutrition Society Textbook Series. Blackwell Publishing Company
- Garrow, J.S., James, W.P.T. and Ralph, A. (2000) *Human Nutrition and Dietetics*. 10th ed. Churchill Livingstone.
- Marian M, Russel M, Shikora SA. (2008) *Clinical Nutrition for Surgical Patients*. Jones and Bartlett Publishers.
- McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society

for Parenteral and Enteral Nutrition (ASPEN). *Journal of Parenteral and Enteral Nutrition, 40*(2), pp.159-211.

Teaching Plan:

Week 1: Nutritional support- Parental nutrition

Week 2: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in Nonalcoholic fatty liver disease (NAFLD), Cirrhosis

Week 3: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in **:**End stage liver disease (ESLD),Encephalopathy

Week 4: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Pancreatitis, Liver transplant, Cholecystitis

Week 5: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:**Cholelithiasis, Myocardial infarction, angioplasty, heart transplant

Week 6: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Heart transplant (cont), surgery, burn

Week 7: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Cancer, Sepsis

Week 8: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:**Nephotic syndrome, Glomerulonephritis

Week 9: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Acute Renal Failure, Chronic Kidney Disease, ESRD

Week 10: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** ESRD, Dialysis

Week 11: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Renal Transplant, Renal Stones

Week 12: Etiopathophysiology, metabolic &clinical aberrations, complications, treatment, MNT in**:** Alzheimer's disease, Parkinson disease

Facilitating the achievement of Course Learning Outcomes

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Develop a detailed understanding of the etiology, physiological and metabolic anomalies of various acute and chronic disorders / diseases	Discussion	Assignment on etiology, physiological and metabolic anomalies of various acute and chronic disorders / diseases
2.	Demonstrate competency in nutrition assessment and diet history interview skills	Discussion	Assignment and practice interactive sessions in nutrition assessment and diet history interview skills

3.	Develop understanding and expertise on the effect of various disorders on nutritional status, nutritional and dietary requirements	Discussion	Assignment on various disorders on nutritional status, nutritional and dietary requirements
4.	Use critical thinking and clinical reasoning to develop nutritional care plan for prevention and treatment of various disorders / diseases	Discussion	Diet plans for prevention and treatment of various disorders / diseases
5.	Apply the knowledge to plan medical nutritional therapy for treatment of various disorders/ diseases.	Discussion	Planning medical nutritional therapy of nutritionally vulnerable individuals using best evidence.

DDPHNCC 205: CLINICAL NUTRITION PRACTICAL

Marks: 50 **Duration: 3 Hrs.**

Course Objectives:

To enable students to develop skill in nutritional diagnosis, planning and providing suitable preventive/ therapeutic diets for various diseases / disorders

Course Learning Outcomes:

Student will be able to -

1. Develop skill in nutritional diagnosis, planning and providing suitable preventive/ therapeutic diets for various diseases / disorders.
2. Provide effective dietary counseling for these disorders.
3. Understand various commercial nutritional therapeutic products available in the market.

CONTENTS **PERIODS**

UNIT I: **1**

- Market Survey for commercial nutritional therapeutic products

UNIT II:

- Planning & preparation of diets for the following conditions: **11**
  - Post burn
  - Liver Cirrhosis

- Hepatic Encephalopathy
- Pancreatitis
- Myocardial infarction
- Nephritis
- Acute Renal Failure
- Chronic renal failure
- Patients on dialysis

Suggested Readings:

- DorlandWA Newman. (2003) *Dorland's Illustrated Medical Dictionary*. 30th ed. WB Saunders Co.
- Escott-Stump, S. (2002) *Nutrition and Diagnosis Related Care*. 5th ed. Williams and Wilkins.
- Garrow, J.S., James, W.P.T. and Ralph, A. (2000)*Human Nutrition and Dietetics*. (10th ed.) Churchill Livingstone.
- Mahan, L. K. and Escott Stump. S. (2016) *Krause's Food & Nutrition Therapy* 14th ed. Saunders-Elsevier.
- Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in Health and Disease*. (10thed.)Lipincott, William and Wilkins.
- Mahan, L. K. and Escott Stump. S. (2016) *Krause's Food & Nutrition Therapy*. (14th ed.) Saunders-Elsevier.
- Joshi Y K.(2008) *Basics of Clinical Nutrition* 2nd ed. Jaypee Brothers Medical Publishers.
- Williams, S.R. (2001) *Basic Nutrition and Diet Therapy*. (11th ed.)Times Mirror Mosby College Publishing.
- Davis, J. and Sherer, K. (1994) *Applied Nutrition and Diet Therapy for Nurses*. (2nded). W. B. Saunders Co.
- Fauci, S.A et al (1998) *Harrison's Principles of Internal Medicine* 14th ed. McGraw Hill.
- Guyton, A.C and Hall, J.E. (2000) *Textbook of Medical Physiology.*(10th ed.) India: Harcourt Asia.
- Ritchie, A.C (1990) *Boyd's Textbook of Pathology*. (9thed.) Lea and Febiger, Philadelphia
- World Cancer Research Fund & American Institute for cancer research (2007) *Food, Nutrition, Physical Activity and the Prevention of Cancer- A Global Perspective*. Washington E.D. WCRF.
- Gibson SR. (2005) *Principles of Nutritional Assessment*. (2nded.) Oxford University press.
- Gibney MJ, Margetts BM, Kearny JM & Arab I. (2004). *Public Health Nutrition*. NS Blackwell publishing.
- Gibney MJ, Elia M, Ljungqvist&Dowsett J. (2005) *Clinical Nutrition*. The Nutrition Society Textbook Series. Blackwell publishing Company.
- Marian M, Russel MK, Shikora SA. (2008) *Clinical Nutrition for Surgical Patients*. Jones & Bartlett Publisher.
- McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society

for Parenteral and Enteral Nutrition (ASPEN). *Journal of Parenteral and Enteral Nutrition, 40*(2), pp.159-211.

DDPHNCC 206: INSTITUTIONAL AND HOSPITAL FOOD MANAGEMENT THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:

To develop knowledge in managing food service in a different institutions and healthcare set up and to equip individuals in managing resources in a food service institution.

Course Learning Outcomes:

Student will be able to -

1. Steer expertise to function as a food service manager.
2. Develop knowledge in managing food service in a healthcare set up.
3. Understand and manage resources in a food service institution.
4. Gain practical experience in managing food material for food service management.

CONTENTS **PERIODS**

UNIT I: Organization and Management **9**

- Management Theories: Classical, Scientific, Systems approach, MBO, JIT, TQM, QWL
- Tools of Management
- Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget
- Intangible tools: Communication, Leadership, Decision making and its application in hospitals and other food service organizations

UNIT II: Hospital Food Service Management **7**

- Meal Ordering System (manual, electronic)
- Patient menu construction
- Menu card/ display
- Food production processes for various situations
- Guidelines of regulatory bodies

UNIT III: Institutional Resource Management **24**

- Personnel Management
  - Functions of a personnel manager, absenteeism, labour turnover
  - Recruitment and selection process - Process and Sources-Internal and External, Process interview, Tests
  - Orientation and Training- Importance of orientation and training, content of programme, Steps of developing an Orientation programme, Types of training - OJT, Group; continuous training, training for development, Developing a training programme

- Appraisal of employees – Importance, Methods, Limitation
- Motivating employees- Motivation theories and approaches -Content theories: Maslow, Herzberg, McClelland; Process theories: Vroom, Equity; Reinforcement theory; Techniques of motivating employees
- Employee behavior and policies

- Financial and Marketing
  - Managing finances in a catering establishment
  - Records: Menu, Purchase, Store, Production, Sales, Personnel, Utilities
  - Reports : Cost analysis: Concept of Trial Balance, Profit and Loss Account
    - Marketing techniques and strategies
- Equipments and Layouts in Food Service Units (Hospitals and theme restaurants)
  - Types of equipments
  - Steps in layout planning and architectural features
  - Feasibility assessment in terms of layout planning
  - Application in hospitals and food service organizations

UNIT IV: Food Safety and Hygiene **8**

- HACCP
- GMP,GHP
- Food safety and standard regulations
- Food Safety in different food service units (Hospitals and other catering establishments)

Suggested Readings:

- West B Bessie & Wood Levelle (1988) *Food Service in Institutions* 6th Edition Revised By Hargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company New York.
- SethiMohini (2005) *Institution Food Management*. New Age International Publishers
- Kazarian E A (1977) *Food Service facilities Planning*. 3rd Edition Von Nostrand Reinhold New York.
- Kotas Richard &Jayawardardene. C (1994) *Profitble Food and Beverage Management*. Hodder & Stoughton Publications
- Kotler Philip(2001) *Marketing management Millennium* Edition Prentice Hall of India
- Taneja S and Gupta SL (2001) *Entrepreneurship Development*.Galgotia Publishing
- Dessler Gary (2007) *Human Resource Management* 11th edition Prentice Hall New Jersey
- Luthans Fred (2004) *Organisational Behaviour* 10th Edition Mc Graw Hill International
- Basic Food Safety Training Manual Catering (http://www.fssai.gov.in/home/capacity building/e-library/training-manual.html)
- Street Food Vendor Training on Food Safety and Hygiene (http://www.fssai.gov.in/home/capacity building/e-library/training-manual.html)

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Teaching Plan:

Week 1: Classical, Scientific, Systems approach, Management by Objectives, Just-in Time, Total Quality Management, Quality of Work Life, Tools of management (Introduction)

Week 2: Tools of management**:** Tangible Tools**:** Organization chart, Job description, Job specification, Job analysis**:** Path way chart, Process chart, Work schedule**,** Production schedule, Staff and service analysis, Budget
Week 3: Intangible tools**:** communication, leadership, decision making, food production cycle in various institutions**:** meal ordering system (manual, electronic)
Week 4: Hospital Food service Management**:** Meal ordering system, menu construction, menu card/ display, food production processes for various situations
Week 5: Hospital Food service Management**:** Guidelines of regulatory bodies, Institutional Resource Management**.**
Week 6: Manpower: Orientation and Training**;** Appraisal of employees – Importance, Methods, Limitation
Week 7: Manpower: Motivation theories and approaches**;** Employee behavior and policies
Week 8: Finance and Marketing: Managing finances in a catering establishment; Records**:** Menu, Purchase, Store, Production, Sales, Personnel, Utilities
Week 9: Finance and Marketing: Reports**,** Cost analysis
Week 10: Equipment and Layouts in food service UNITs Types of equipment, Steps in layout planning and architectural features
Week 11: Equipment and Layouts in food service UNIT Feasibility assessment in terms of layout planning, Food safety and hygiene: HACCP, Good Manufacturing Practices (GMP), and Good Hygiene Practices (GHP)
Week 12: Food safety and hygiene: FSSA 2006, Food safety in hospital and other different food service units

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Develop insight about basic concept of catering management	Discussion	Assignment on various theories of management
2.	Understand manage food service in healthcare	Discussion, visits to healthcare system	Report of the visits
3.	Understand resource management in a food service unit	Discussion	Assignment on collecting information on various resources in management
4.	Develop insight of new laws regulation in food safety for food service units	Discussions	Assignment

DDPHNCC 206: INSTITUTIONAL AND HOSPITAL FOOD MANAGEMENT PRACTICAL

Marks : 50 **Duration: 3 Hrs.**

Course Objectives:
To develop skills in menu planning, quantity food production for various food service organizations within specific budgets.

Course Learning Outcomes:
Student will be able to-

1. Understand the operations of food service units.
2. Develop insight about products and their price in market.
3. Develop skills in planning menus for various food service organizations within specific budgets.
4. Application of acquired skills in menu planning and quantity food production

CONTENTS **PERIODS**

UNIT I: **1**
Market survey of various food products raw and processed in different kind of markets

UNIT II: **2**

- Planning menus for the following:
  - Conference
  - Food stall

UNIT III: **3**

- Planning menu and adjusting nutrients and cost for the following:
  - Food items for MDM
  - Cyclic menu for hospital (government/private)

UNIT IV: **`4**

- Standardization and quantity cooking
  - Canteen project

UNIT V: **2**

- Developing a checklist for Hospital personnel in hygiene and sanitation

Suggested Readings:

- West B Bessie & Wood Levelle (1988) *Food Service in Institutions* 6th Edition Revised By Hargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company New York.
- SethiMohini (2005) *Institution Food Management*. New Age International Publishers
- Kazarian E A (1977) *Food Service facilities Planning.* 3rd Edition Von Nostrand Reinhold New York.
- Kotas Richard &Jayawardardene. C (1994) *Profitble Food and Beverage Management.* Hodder & Stoughton Publications
- Taneja S and Gupta SL (2001) *Entrepreneurship Development*, Galgotia Publishing
- FSSAI guidelines for `Food Safety Training and Certification for Food Business Operators

DDPHNCC 207: NUTRITIONAL BIOCHEMISTRY
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:

To augment the biochemistry knowledge acquired at the undergraduate level and to understand the basic genetics, carbohydrate, lipid and amino acid metabolism

Course Learning Outcomes:

Student will be able to-

1. Having coherent and systematic knowledge on carbohydrate, lipid and amino acid metabolism.
2. Understanding the mechanism adopted by the human body for regulation of metabolic pathways.
3. Learning basics of DNA, RNA and translation
4. Understanding the roles of vitamins and minerals.

CONTENTS **PERIODS**

UNIT I: Carbohydrates **12**

- Structures- monosaccharides (glucose, fructose, maltose, galactose); disaccharides (sucrose, maltose, lactose); Polysaccharides (starch and glycogen)
- Glycolysis and gluconeogenesis and their regulation
- Citric acid cycle and its regulation
- Glycogenolysis
- Blood sugar regulation by insulin, glucagon and epinephrine
- Pentose phosphate pathway

UNIT II: Lipids **12**

- Classification of lipids
- β-oxidation

- *De novo* synthesis of fatty acids and their elongation
- Ketosis
- Fatty liver
- Lipoproteins – types, synthesis, degradation and clinical significance
- Cholesterol – synthesis and regulation

UNIT III: Proteins **10**

- Structures of amino acids
- Protein structure
- Transamination of amino acids
- Biosynthesis of Urea

UNIT IV: Nucleic Acids **10**

- Structure of Nucleotides.
- Basic structure of nucleic acids (DNA & RNA)
- Genetic code
- Genetic mutations
- Protein biosynthesis

UNIT V: Vitamins and Minerals **4**

- Role of vitamins and minerals as coenzymes and cofactors
- Metabolism of iron and calcium in human body

UNIT VI: Clinical Biochemistry **12**

- Evaluation/Interpretation of changes in various biochemical parameters changes in various pathological conditions diseases

Suggested Readings:

- Berg JM, Stryer L, Tymoczko JL and Gatto GJ. (2015) *Biochemistry* 8th ed. W.H. Freeman.
- Devlin TM. (2010) *Text Book of biochemistry with Clinical Correlations* 7th ed. John Wiley and Sons.
- Rodwell VW, Bender DA, Botham KM, Kennelly PJ and Weil PA. (2015) *Harper's Illustrated Biochemistry*. 30th ed. McGraw-Hill. Asia.
- Nelson DL and Cox MM. (2017) *Principles of Biochemistry*. 7th ed. W.H. Freeman.
- Voet D and Voet JG. (2004) Biochemistry 3rd ed. John Wiley and Sons.
- Medical Laboratory Technology - a Procedure Manual for Routine Diagnostic Tests Vol. I (2010), Mukherjee, K.L., Tata Mc Graw–Hill Publishing Company Limited (New Delhi). ISBN:9780070076594 / ISBN:9780070076631
- Medical Laboratory Technology - a Procedure Manual for Routine Diagnostic Tests VoI. II (2010) Mukherjee, K.L., Tata Mc Graw – Hill Publishing Company Ltd. (New Delhi), ISBN: 9780070076648.
- Medical Biochemistry (2005) 2nd ed., Baynes, J.W. and Dominiczak, M.H., Elsevier Mosby Ltd. (Philadelphia), ISBN:0-7234-3341-0.

Teaching Plan:
Week 1: Structures- monosaccharides (glucose, fructose, maltose, galactose); disaccharides (sucrose, maltose, lactose); Polysaccharides (starch and glycogen), Glycolysis and its regulation
Week 2: Citric acid cycle and its regulation, Gluconeogenesis
Week 3: Glycogenolysis, Blood sugar regulation by insulin, glucagon and epinephrine
Week 4: Pentose phosphate pathway, Classification of lipids, β-oxidation
Week 5: De novo synthesis of fatty acids
Week 6: Lipoproteins – types, synthesis, degradation and clinical significance
Week 7: Cholesterol – synthesis and regulation, Structures of amino acids
Week 8: Protein structure, Transamination of amino acids
Week 9: Biosynthesis of Urea, Structure of Nucleotides
Week 10: Basic structure nucleic acids (DNA & RNA); Genetic code
Week 11: Genetic mutations, Protein biosynthesis
Week 12: Role of vitamins and minerals (calcium, phosphorous, iodine, selenium, zinc), Metabolism of iron and calcium in human body

Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Carbohydrate structures, major carbohydrate metabolic pathways, blood sugar regulation	Classroom lectures, Discussion on important discoveries in metabolism	Short assignment and quiz
2.	Classification of lipids, lipid metabolism, lipoproteins and cholesterol biosynthesis	Classroom lectures,	Test
3.	Structure of amino acids and proteins, biosynthesis of urea	Classroom lectures, short presentations,	Assignment
4.	Structure of nucleotides and nucleic acids, ketosis, protein biosynthesis	Classroom lectures, short presentations	Test and quiz
5.	Overview of biochemical roles of vitamins and minerals	Classroom lectures,	Oral test
6.	Acquire ability to analyse and interpret the biochemical parameters of disease conditions in clinical/hospital set ups	Study of simulated case profiles of diseased conditions	Test and quiz

DDPHNCC 208: SEMINAR AND SCIENTIFIC WRITING
THEORY

Marks : 50 **Duration: 3 Hrs.**

Course Objectives:
To develop preliminary insight for research papers and comprehend a scientific paper's objectives, results and its application in Indian context to develop skills in presenting a scientific paper.

Course Learning Outcomes:
Student will be able to-

1. Develop preliminary insight for research papers.
2. Comprehend a scientific paper's objectives, results and its application in Indian context.
3. Acquire skills in presenting a scientific paper.

CONTENT	PERIODS
• Scientific report development and Presentation of the reviews on upcoming nutrition and food science advances	24

DDPHNEC 23: FOOD MICROBIOLOGY AND FOOD SAFETY
THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:
To provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.

Course Learning Outcomes:
Student will be able to -

1. Understand the nature of microorganisms involved in food spoilage, food infections and intoxications.
2. Comprehend principles of various preservation and control techniques.
3. Understand microbial safety in various foods operations.

CONTENTS	PERIODS
UNIT I: Basic Microbiology	**13**
• Introduction to microbiology	
• Characteristics of microorganisms	

- Factors effecting microbial growth

UNIT II: Food Spoilage and Preservation **12**

- Food spoilage
- Principles and methods of food preservation

UNIT III: Beneficial Role of Food Microbes in Health **4**

- Importance of normal flora, prebiotics and probiotics
- Fermentation
- Single cell proteins
- Fermented food products

UNIT IV: Food Borne Microbial Diseases **7**

- Public health hazards: Food borne infections and intoxications
- Symptoms, mode of transmission and methods of prevention
- Emerging food pathogens

UNIT V: Food Safety and Quality Control **14**

- Food hazards
- Concept of risk analysis
- Concept of Food Safety Management System, GHP and GMP
- HACCP, ISO 22000
- Accreditation and Auditing
- Food Laws, Regulations and Standards

Suggested Readings:

- Frazier, W.C. &Westoff, D.C.(2013) *Food Microbiology. 5th edition*. Tata McGraw-Hill Publishing Co. Ltd.
- Garbutt, J. (1997)*Essentials of Food Microbiology*. Arnold London.
- Jay, J.M., Loessner, D.A. & Martin, J.(2006)*Modern Food Microbiology. 7th edition.* Springer
- Banwart, G.J.(2004)*BasicFood Microbiology*. *2nd edition*. CBS Publishers and Distributors, India.
- Pelczar, M.J., Chan, E.C.S., Krieg, N. (1993)*Microbiology. 5th edition*. Tata McGraw-Hill Publishing Co. Ltd.
- Prescott, L.M., Harley, J.P. & Klein, D.A. (2017)*Microbiology. 10thedition*. Tata McGraw-Hill Publishing Co. Ltd.
- Mathur, P. (2018)*Food Safety and Quality Control*. *1st Edition*. Orient Blackswan Private Ltd. India.
- Forsythe, J.S. (2011)*The Microbiology of Safe Food. 2nd Edition.* Wiley-Blackwell Publishing.
- Ravishashankar, R. &Jamuna, B. (2015)*Microbial Food Safety and Food Preservation*. CRC Press, Boca Raton.
- FSSAI *Manual of Methods of Analysis of Foods- Microbiological Testing*. (2012) Lab Manual 14. FSSAI, GoI, New Delhi.

Teaching Plan:
Week 1: Introduction to Microbiology
Week 2: Characteristics of Micro-organisms
Week 3: Factors affecting growth of Micro-organisms
Week 4: Food spoilage
Week 5: Methods of food preservation
Week 6: Beneficial role of food microbes
Week 7: Food infection and Intoxication, symptoms and mode of transmission
Week 8: Food borne illnesses
Week 9: Emerging food pathogens
Week 10: Food safety and quality and food hazards
Week 11: Concept of risk analysis and FSMS
Week 12: Accreditation, Auditing, National and International food laws and standards

Facilitating the achievement of course learning outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Basic Microbiology	Understand the nature of various groups of micro-organism, their morphology, extrinsic and intrinsic factors affecting their growth.	Simple staining and Differential staining, Quizzes, Assignments
2.	Food Spoilage and Preservation	Understand the nature of micro-organism involved in food spoilage	Analysis using MBRT, MPN, TPC, Quizzes, Assignments
3.	Beneficial role of Food Microbes in Health	Understand the beneficial role of food microbes used for fermentation etc.	Analysis of Curd, and Probiotic count, Quizzes, Assignments
4.	Food Borne Microbial Diseases	Understand the role of microbes in causing public health hazard due to food contamination	Swab Test, Ringers Test. Personal hygiene assessment, Quizzes, Assignments
5.	Food Safety and Quality Control	Acquaint with various laws and microbiological standards to be maintained during food processing, HACCP, GMP, FSSAI, CODEX	Adulteration test for various food products, Quizzes, Assignments

DDPHNEC 23: FOOD MICROBIOLOGY AND FOOD SAFETY PRACTICAL

Marks: 50 **Duration:3 Hrs.**

Course Objectives:
To familiarize with the techniques and methods used for cultivation, purification and identification of microbes

Course Learning Outcomes:
Student will be able to-

1. Understand the morphology and structural features of various micro-organisms.
2. Comprehend various techniques used for isolation, purification and controlling the growth of micro-organisms
3. Assess the microbial safety of personal hygiene, water, milk and other food products.

CONTENTS **PERIODS**

UNITI: **2**

- To Study Morphology and Structural Features of Various Micro-organisms
  - Simple staining
  - Differential staining

UNIT II: **3**

- To Study the Various Techniques and Instruments Used in Microbiology
  - Sterilization and Disinfection
  - Filtration, biosafety cabinets
  - Chemical methods (Ethanol and Antibiotics)

UNIT III: **2**

- Isolation of Microorganisms
  - Pure Culture Technique
  - Standard Plate Count Method

UNIT IV: **5**

- Microbiological Analysis For
  - Water (Most Probable Number)
  - Milk (Methylene Blue Reduction Test)
  - Curd and probiotic count
  - Adulteration test for various food products

UNIT V: **2**

- Assessment of Sanitation and Hygiene
  - Swab and Rinse technique
  - Assessment of personal hygiene

Suggested Readings:

- Bell, C., Neaves, P. & Williams, A.P. (2005) *Food Microbiology and Lab Practice*. Wiley Press.
- Yousef, A.L. (2003)*Food Microbiology. A Laboratory Manual.* Wiley Inter-Science New Jersey.
- Benson, H.J. (2002)*Microbiological Application*.8th Edition. Tata McGraw Hill.
- Mortimore & Wallace. (2013)*HACCP: A Practical Approach*. 3rd Edition. Springer Publication.
- Cappuccino & Sherman. (2007) *Microbiology: A Laboratory Manual*. 7th Edition. Pearson Education Inc.
- Hoorfar, J. (2011) *Rapid Detection, Characterization and Enumeration of Food Borne Pathogens*. American Society for Microbiology, Washington, USA.
- BIS: *Drinking Water Specification- Indian Standard*. (2012)2nd Revision. IS 10500:2012. Bureau of Indian Standard, ManakBhawan, New Delhi, India.
- FSSAI *Manual of Methods of Analysis of Foods- Microbiological Testing*. (2012) Lab Manual 14. FSSAI, GoI, New Delhi.

DDPHNEC 24: POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION THEORY

Marks: 100 **Duration: 3 Hrs.**

Course Objectives:

To familiarize with the government policies and programmes based on various approaches for improving nutritional and health status of the community. It will also expose them to the concept of nutritional surveillance and the process of programme planning in public health nutrition.

Course Learning Outcomes:

1. Become familiar with the various approaches and strategies for improving nutritional and health status.
2. Get exposure to various Government policies and programmes aimed at improving the nutritional and health status of the population
3. Acquire knowledge about the process of planning public health nutrition programmes

CONTENTS **PERIODS**

UNIT I: Approaches and Strategies for Improving Nutritional and Health Status 14

- Health based interventions including immunization, provision of safe drinking water/sanitation, prevention and management of diarrhoeal diseases
- Food based interventions including fortification, use of biotechnology, supplementary feeding
- Education based interventions including growth monitoring and promotion, communication for health and nutrition behaviour change

UNIT II: National Policies for Promotion of Nutrition and Health Status of the Population **10**

- National Nutrition Policy and National Nutrition Mission
- National Food Security Act
- National Health policy
- Population policy
- National water policy
- National Urban Sanitation Policy

UNIT III: National Nutrition and Health Programmes **12**

- Components, administration and evaluation of programmes for prevention and control of micronutrient deficiencies and improving food and nutrition security

UNIT IV: Nutritional Surveillance **4**

- Objectives, initial assessment indicators for use in nutrition surveillance
- Nutritional surveillance for programme planning: Triple A approach

UNIT V: Programme Planning **8**

- Diagnosis of situation, setting of objectives, suitability and relative costs of various strategies, implementation, monitoring and evaluation

Suggested Readings:

- Gibney M.J., Margetts, B.M., Kearney, J.M. Arab, I. eds (2004) *Public Health Nutrition*, NS Blackwell Publishing.
- National Nutrition Policy, GOI, New Delhi, 1993
- Owen, A.Y. and Frankle, R.T. (1986) *Nutrition in the Community*. The Art of Delivering Services, 2nd ed. Times Mirror/Mosby.
- Park, K. (2017) *Park's Textbook of Preventive and Social Medicine*, 24th ed. Jabalpur M/s. BanarsidasBhanot.
- Vir, S. (2011). *Public health nutrition in developing countries Part-1 & 2.* Woodhead Publishing India limited.
- Wadhwa, A. and Sharma, S. (2003) *Nutrition in the Community*. A textbook. SCN News, UN ACC/SCN Subcommittee on Nutrition

Teaching Plan:

Week 1: Health based interventions including immunization, provision of safe drinking water/sanitation, prevention and management of diarrhoeal diseases

Week 2: Food based interventions including fortification, use of biotechnology, supplementary feeding

Week 3: Education based interventions including growth monitoring and promotion, communication for health and nutrition behaviour change

Week 4: Education based interventions including growth monitoring and promotion, communication for health and nutrition behaviour change, National Nutrition Policy, National Nutrition Mission

Week 5: National Nutrition Mission, National Food Security Act, National Health policy
Week 6: Population Policy, National water policy, National Urban Sanitation Policy
Week 7: Components, administration and evaluation of programmes for prevention and control of micronutrient deficiencies
Week 8: Components, administration and evaluation of programmes for prevention and control of micronutrient deficiencies and improving food and nutrition security
Week 9: Components, administration and evaluation of programmes for improving food and nutrition security
Week 10: Nutritional Surveillance**:** Objectives, initial assessment indicators for use in nutrition surveillance, Nutritional surveillance for programme planning**:** Triple A approach
Week 11: Programme Planning**:** Diagnosis of situation, setting of objectives, suitability and relative costs of various strategies
Week 12: Programme Planning**:** implementation, monitoring and evaluation

Facilitating the Achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching And Learning Activity	Assessment Tasks
1.	Become familiar with the various approaches and strategies for improving nutritional and health status	Lecture-cum-Discussion	Assignment/ Test
2.	Get exposure to various Government policies and programmes aimed at improving the nutritional and health status of the population	Lecture-cum-Discussion, Films on national programmes	Assignment/ Test, Student Presentations
3.	Acquire knowledge about the process of planning public health nutrition programmes	Lecture-cum-Discussion	Assignment/ Test, Student Presentations

DDPHNEC 24: POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION PRACTICAL

Marks: 50 **Duration: 3 Hrs.**

Course Objectives:

To plan and prepare cyclic menu/ low cost nutritious dishes for vulnerable groups for nutritional improvement of the community and to become familiar with ongoing national nutrition programmes.

Course Learning Outcomes:

Student will be able to-

1. Plan and prepare cyclic menu/ low cost nutritious dishes for vulnerable groups
2. Familiarize with ongoing national nutrition programmes
3. Plan and implement interventions for nutritional improvement of the community

CONTENTS	PERIODS
UNIT I:	**3**
• Planning and preparation of cyclic menu for a school feeding programme	
UNIT II:	**1**
• Field visit to ongoing National Nutrition Programmes	
UNIT III:	**4**
• Development of a plan for nutrition education programme in community. • Preparation of communication aids for different groups. Implementation of programme in community	
UNIT IV:	**4**
• Development of low cost recipes for elementary school children, adolescents, pregnant and lactating mothers	

Suggested Readings:

- *Basic food preparation* (2010) Fourth edition, Lady Irwin College.
- Chadha R, Mathur, P(2015) *Nutrition A life cycle Approach*. Orient BlackSwan Pvt. Ltd., Lady Irwin College.
- Indian Council of Medical Research: Dietary Guidelines for Indians (2011)*Dietary Guidelines for Indians: A manual*. Second edition, National Institute of Nutrition.
- Longvah T, Ananthan R, Bhaskarachary K, Venkaiah K (2017) *Indian food composition tables*. National Institute of Nutrition.
- Khanna, K, Gupta, S, Sethi, R, Mahna, R, Rekhi, T. (2004)*The Art and science of cooking-A Practical Manual*. Elite Publishing House Pvt. Ltd.

INTERNSHIP

- **A three month internship in a tertiary, multispeciality, minimum hundred bedded hospital with a Dietetics department is compulsory at the end of the course, for successful completion and for award of Diploma by the University.**