POST GRADUATE DIPLOMA IN DIETETICS AND PUBLIC HEALTH NUTRITION

PG SEMESTER SYSTEM
CURRICULUM

DEPARTMENT OF HOME SCIENCE
(UNIVERSITY OF DELHI)

FEBRUARY 2010

Post Graduate Diploma in
Dietetics and Public Health Nutrition

Semester I

Paper No.	Paper	Marks	Credits	Periods/wk	Duration of exam (Hrs)
0111	Human Physiology	100	4	4	3
0112	Therapeutic Nutrition I	100	4	4	3
0113	Public Health Nutrition	100	4	4	3
0114	Food Service Management	100	4	4	3
0115	Practical: TN I, PHN, FSM Seminar	100	4	9 1	12(6 Hrs on 2 days)
	Total	500	20	26	

Semester II

Paper No	Paper	Marks	Credits	Periods/wk	Duration of exam (Hrs)
0211	Nutritional Biochemistry	100	4	4	3
0212	Therapeutic Nutrition II	100	4	4	3
0213	Perspectives in Food and Nutrition Security	100	4	4	3
0214	Food Service Management & Food Microbiology	100	4	4	3
0215	Practical: TN II, PFNS, FSM & Food Microbiology Seminar	100	4	9 1	12(6 Hrs on 2 days)
	Total	500	20	26	

Note:

1. Pass percentage: The minimum marks required to pass the examination at the end of the academic year shall be 40 percent in the aggregate of written papers, 40 percent in the aggregate of practical papers, 40 percent in the Seminar and 50 percent in the overall aggregate.

2. As per the University directive, 25 percent of the maximum marks in each theory course will be assigned for internal assessment.

3. The practical examination for all courses shall be conducted over a period of 2 days for 6 hours each.

4. The duration of the Course shall be one academic year followed immediately by 3 months Internship in an Institution recognized by the Academic Council in that behalf. No candidate who has passed the examination shall be awarded the Diploma unless she has undergone the Internship in an Institution, as aforesaid to the satisfaction of the Head of the Institution where she has been studying.

DETAILED COURSES - PGDDPHN

SEMESTER I

HUMAN PHYSIOLOGY

Paper No. : **0111**
Maximum Marks : **100**
Teaching Periods : **4/week**
Teaching Load : **48-50/semester**

OBJECTIVES

1. To understand the current state of knowledge about the functional organization of the human body.
2. To be able to correlate physiology with various disorders and their pathogenesis.

CONTENTS **PERIODS**

UNIT I **18**

Blood and Cardio-Thoracic and Excretory Physiology

- Blood -Composition and Function
- Plasma Protein -Composition and Function
- Cardiac cycle, Cardiac output, E.C.G.
- Blood pressure, Hypertension, Coronary Artery Disease
- Lung volume and Capacities .
- Respiratory function tests
- Urine formation, Renal function tests
- Acid Base balance

UNIT II

Exercise Physiology 8

- Concept of Fitness
- Energy Metabolism in Sports
- Overview of Diet and Physical Performance

UNIT III

Gastrointestinal physiology 10

- Composition ,function and regulation of :

  Saliva

  Gastric juice

  Pancreatic juice

  Bile

  Intestinal juice

  GI hormones

UNIT IV

Neuro-Endocrine and Reproductive Physiology 12

- Overview of organization of nervous system
- Effects of Pituitary, Thyroid, Parathyroid, Adrenal and Pancreatic hormones
- Physiology of Menstruation and Menopause
- Physiology of Pregnancy and Lactation

RECOMMENDED 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.
- Chaudhari S K(2000) Concise Medical Physiology.3rd Edition. Central .
- West J.B.(1996): Physiological Basis of Medical Practice.12th Edition. B. I. Waverly Pvt. Ltd.

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THERAPEUTIC NUTRITION I

THEORY

Paper No. : 0112
Maximum Marks : 100
Teaching Period : 4 periods/ week
Teaching Load : 48-50 periods/semester

OBJECTIVES

1. To understand the etiology, physiological and metabolic anomalies of acute and chronic disorders / diseases.
2. To understand the effect of various disorders / diseases on nutritional status, nutritional and dietary requirements.
3. To be able to recommend and provide appropriate nutrition care for prevention and treatment of various disorders / diseases.
4. To remain updated on recent advances in Medical Nutrition Therapy (MNT)

CONTENTS **PERIODS**

UNIT I: Nutrition Care **12**

a) Nutrition care process in MNT
- Nutritional screening and assessment
- Nutritional interpretation of routine medical and laboratory data
- Nutrition care plan and implementation
  – qualitative and quantitative dietary modifications and progressive diets
- Dietary counselling
- Monitoring and follow up
- Ethical issues

b) Nutritional support methods
- Enteral nutrition
- Parenteral nutrition

c) Diet, nutrient and drug interactions

UNIT II: Weight Management and Metabolic Stress 14

Recent advances in etio pathophysiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT - prevention and dietary counselling in :

- Obesity
- Underweight
- Eating disorders

- Metabolic stress -
  critical care, surgery, burns, injury and trauma, sepsis

- HIV/AIDS

UNIT III: Management of Metabolic disorders 11

Recent advances in etiopathophysiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT - prevention and dietary counselling in :

- Diabetes Mellitus
- Gout

UNIT IV: Management of Cardio-Vascular Disorders 11

Recent advances in etiopathophysiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT - prevention and dietary counselling in

- Diseases of the cardiovascular system:
  CAD - HT, Hyperlipidemia, Atherosclerosis, Metabolic Syndrome, MI, CHF, Coronary bypass surgery
- Cerebrovascular disease, Peripheral vascular disease.

RECOMMENDED READINGS

- Mahan L. K. and Escott Stump S. (2008) *Krause's Food & Nutrition Therapy 12th ed.* Saunders-Elsevier.
- Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005) *Clinical Nutrition*. The Nutrition Society Textbook Series. Blackwell Publishing Company.
- William's Basic Nutrition and Diet Therapy. 13th Edition. Stacy Nix (2009) Elsevier Mosby.
- Garrow, J.S., James, W.P.T. and Ralph, A. (2000) *Human Nutrition and Dietetics. 10th ed.* Churchill Livingstone.
- Lee RD & Neiman DC. (2009). Nutritional Assessment.. 5th edition. Brown & Benchmark.
- Dorland WA Newman. (2003) *Dorland's Illustrated Medical Dictionary. 30th ed*. WB Saunders Co.

PUBLIC HEALTH NUTRITION

THEORY

Paper No. : 0113
Maximum Marks : 100
Teaching Periods : 4/week
Teaching Load : 48-50 periods/semester

OBJECTIVES

1. To understand the concept of Public Health Nutrition.
2. To understand the National Health Care Delivery System.
3. To understand the causes and consequences of nutritional problems in the community.
4. To orient the students with the methodologies applied in nutritional assessment of individuals and communities.

CONTENTS **PERIODS**

UNIT I: Public Health Nutrition **14**

- Aim, scope and content of Public Health Nutrition
- Role of Public Health Nutritionist in National development
- Health – Definition, dimensions, determinants and indicators
- National Health Care Delivery System - Health care of the community, Health care systems

UNIT II: Assessment of Nutritional Status of Individual and Community **10**

- Direct methods – anthropometry, biochemical, biophysical and clinical methods
- Indirect methods –dietary intake and ecological variables including socio-cultural, biologic, environmental and economic
- Errors in methods of assessing nutritional status

UNIT III: Public Health Aspects of Undernutrition **12**

Etiology, public health implications, preventive strategies for:

- PEM/CED
- Vitamin A deficiency
- Nutritional Anemias
- Iodine Deficiency Disorders
- Vitamin D deficiency and Osteoporosis
- Zinc deficiency

UNIT IV: Public Health Aspects of Lifestyle Related Disorders **12**

Public health implications and preventive strategies for:

- Obesity

- Hypertension
- Coronary heart disease
- Diabetes
- Cancer
- Dental Caries
- Public health aspects of H.I.V/ AIDS

RECOMMENDED READINGS

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- Gibney M.J., Margetts, B.M., Kearney, J.M. Arab, I. eds (2004) *Public Health Nutrition*, NS Blackwell Publishing. .
- Jelliffe, D. B and Jelliffe, E.F.P. (1989) *Community Nutritional Assessment*, Oxford University Press.
- Owen, A.Y. and Frankle, R.T. (1986) *Nutrition in the Community. The Art of Delivering Services*, 2nd ed. Times Mirror/Mosby.
- Park.K. (2009) *Park's Textbook of Preventive and Social Medicine*, 20th ed. M/s Banarsida Bhanot, Jabalpur.
- Wadhwa, A. and Sharma, S. (2003) *Nutrition in the Community*. A text book. SCN News, UN ACC/SCN Subcommittee on Nutrition

FOOD SERVICE MANAGEMENT

THEORY

Paper No. : 0114
Maximum Marks : 100
Teaching Periods : 4/week
Teaching Load : 48-50 periods/semester

OBJECTIVES

1. To understand the different kinds of Food service units & systems.
2. To understand the principles of organization and management.
3. To gain knowledge in various areas of food production.
4. To learn the principles of personnel management.

CONTENTS **PERIODS**

UNIT I: INTRODUCTION TO FOOD SERVICE **4**

- Factors contributing to the growth of food service industry
- Kinds of food service systems

Conventional, commissary, ready prepared, assembly/serve

UNIT II: ORGANIZATION & MANAGEMENT 14

- Management Theories: Classical, Scientific, Behavioral,

Systems approach, Contingency approach, MBO, JIT, TQM

- Functions of management /manager
- Principles of management
- Definition of Organization and steps in organizing

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

UNIT III: FOOD PRODUCTION 16

- Menu planning: Importance of menu, Factors affecting menu planning, Menu construction, Types of menu, Menu card, Qualifications of a menu planner
- Food Purchase: Purchasing methods – Market, Buyer, Vendor, Methods of Purchase: Formal and Informal, Purchasing procedure
- Storage: Types of storage, Store room requirement, Appropriate temperature for storage of different foods, Storeroom Records
- Quantity Food production: Production planning and control, Importance of planning, Production forecast, Estimating quantities to buy Quantity preparation techniques, Production schedule Product evaluation , Standardization of recipes, Recipe adjustments and portion control
- Food delivery and service: Centralized and decentralized, factors affecting selection, Styles of service: self , table, tray equipment for delivery and service

UNIT IV: PERSONNEL MANAGEMENT 14

- Functions of a personnel manager,
- Factors to consider while planning the kind and number of personnel:

Menu, type of operations, Type of service, Job description and job specification

Manpower placement :

- Recruitment: Process and Sources-Internal and External
- Selection: Process interview, Tests
- Orientation: Importance, Content of programme, Developing an Orientation programme
- Training: Importance; Types - OJT, Group; continuous training, training for development , Developing a training programme
- Contract negotiation with employee : appointment letter, establishment of wages, components of wages , rules and regulations, duties, and service and benefits , contact with vendors
- Performance appraisal: Importance, Methods, Limitations
- Leadership: Importance; Styles, traits and skills
- Motivation: Role; Motivation theories and their application-Content theories: Maslow, Herzberg, McClelland; Process theories: Vroom, Equity; Reinforcement theory; Motivational plan and incentives
- Trade unions and collective bargaining, Labor Laws and policies

RECOMMENDED 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.
- Sethi Mohini (2005) Institution Food Management New Age International Publishers
- Koontz Harold & Weihrich Heinz (2006) Essentials of Management 7th edition Tata Mc Graw Hill Book Company .
- Terrell E M (1971) Professional Food Preparation, Wiley publishers (New York)
- Tripathi P C (2000) Personnel management 15th ed Sultan Chand, New Delhi
- Dessler Gary (2007). Human Resource Mangement 11th edition. Prentice H all, New Jersey.

PRACTICAL - Semester I

Paper No. : 0115
Maximum Marks : 100
Teaching Periods : 10/week

Course A: Therapeutic Nutrition I

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals /semester

OBJECTIVES

Equip students for

1. Assessment of nutritional status and nutritional needs of patients
2. Planning and preparation of therapeutic diets for various diseases or disorders
3. Dietary counselling for prevention and treatment of various diseases or disorders

CONTENTS	**PRACTICAL SESSIONS**
UNIT I: Market Survey for special nutritional products	**1**
UNIT II: Assessment of nutritional status for nutrition care	**1**
UNIT III: Planning and preparation of diets for disorders covered in theory with emphasis on dietary progression, special feeds.	**8**
UNIT IV: Diet counselling and preparation of counselling aids	**2**

Course B: Public Health Nutrition

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals /semester

OBJECTIVES

1. To plan and prepare low cost nutritious dishes and menus for vulnerable groups
1. To learn the techniques of assessment of nutritional status
2. To understand the national health care delivery system

CONTENTS	**PRACTICAL SESSIONS**
Unit I: Assessment of nutritional status–diet survey, anthropometry, clinical	**3**
Unit II: Rapid assessment procedures – focus group discussions, in- depth interviews, mapping to study health behaviour, food habits and dietary patterns	**2**

Unit III: Field visit to Primary Health Centre **1**

Unit IV: Development of low cost recipes for infants, preschoolers, elementary school children, adolescents, pregnant and lactating mothers 6

Course C: Food Service Management

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals /semester

OBJECTIVES

1. To understand the dynamics of market through survey

2. To comprehend the working of units through observation

3. To plan menus for events within specified budgets

4. To standardize recipes

CONTENTS **PRACTICAL SESSIONS**

Unit I: Market survey for food items, both raw and processed **2**

Equipment for production and service

To compare cost

Unit II: Field visit to two food service institutions
2

Unit III: Planning menus within specified budget for any 3 of the following: **6**

- Nursery school
- College hostel
- College canteen
- Hospital cafeterias

Unit IV**:** Standardization of a recipe **2**

Course D: Seminar

Teaching Periods : 1/week
Teaching Load : 12 periods / semester

SEMESTER II

NUTRITIONAL BIOCHEMISTRY

THEORY

Paper No. : 0211
Maximum Marks : 100
Teaching Periods : 4 Periods/Week
Teaching load : 48 Periods/Semester

OBJECTIVES:

1.To augment the biochemistry knowledge acquired at the undergraduate level.
2.To understand the mechanism adopted by the human body for regulation of metabolic pathways.
3.To get an insight into interrelationships between various metabolic pathways.
4.To help a student to use the knowledge of biochemistry in nutritional .management..

CONTENTS **PERIODS**

UNIT I: Classification and physical properties of compounds: 8

- Chemical and general properties of Carbohydrates
- Classification of lipids
- Classification of amino acids and proteins

UNIT II:
Carbohydrates 9

- Overview of catabolism of glucose, fructose and galactose.and regulation of glycolysis
- Citric acid cycle and its regulation
- Blood sugar regulation

- Hexose monophosphate pathway.

Lipids **9**

- Overview of β-oxidation.
- Denovo synthesis of fatty acids and their elongation.
- Ketosis.
- Fatty liver.
- Metabolism of lipoproteins.
- Metabolism of cholesterol.

Proteins **9**

- Transamination and deamination of amino acids
- Urea Cycle

UNIT III:

Nucleic acids **9**

- Structure of nucleic acids.
- Genetic code.
- Genetic mutation.
- Protein biosynthesis

UNIT IV:

Minerals 4

- Overview of biochemical role of macro and micro minerals.

RECOMMENDED READINGS

- Berg JM, Tymoczko JL and Stryer L. (2002) Biochemistry 5th ed. W.H. Freeman.
- Devlin Tm. (2002)Text Book of Biochemistry with clinical Correlations. 5th ed. John Wiley and sons.
- Murray RK, Granner DK, Mayes PA and Rodwell VW, (2003) Harper's Illustrated Biochemistry, 26th ed. McGraw-Hill (Asia).
- Nelson DL and Cox MM. (2005) principles of Biochemistry, 4th ed. Freeman and Company.
- Voet D and Voet JG. (2004) Biochemistry 3rd ed. John Wiley and Sons

THERAPEUTIC NUTRITION II

THEORY

Paper No. : **0212**
Maximum Marks : **100**
Teaching Period : **4 periods/ week**
Teaching Load : **48-50 periods/semester**

OBJECTIVES

1. To understand the etiology, physiological and metabolic anomalies of acute and chronic disorders / diseases.
2. To understand the effect of various disorders / diseases on nutritional status, nutritional and dietary requirements..
3. To be able to recommend and provide appropriate nutrition care for prevention and treatment of various disorders / diseases.
4. To remain updated on recent advances in Medical Nutrition Therapy (MNT).

CONTENTS **PERIODS**

UNIT I: Disorders of the G I Tract and accessory organs **14**

Recent advances in etiopatho-physiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT – Prevention and dietary counseling in :

- Upper and lower GIT disorders
  Gastro-esophageal reflux disease and esophagitis, peptic ulcers, dumping syndrome, IBS, diverticular diseases, malabsorption syndromes, lactose intolerance, celiac disease, IBD: Crohn's disease and ulcerative colitis.
- Liver, gall bladder and pancreatic disorders
  - Cirrhosis , Hepatic encephalopathy
  - Cholecystitis, Cholecystectomy
  - Pancreatitis

UNIT II: Renal disorders **12**

Recent advances in etiopatho-physiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT – Prevention and dietary counseling in :

- Nephrotic syndrome
- Glomerulonephritis
- Acute and chronic renal failure

- Dialysis
- Renal transplant
- Renal stones

UNIT III: Musculo-skeletal, Rheumatic, Allergic disorders and Cancer 12

a) Overview of principles of diet management in

- Muscular skeletal and rheumatic disorders
- Osteoporosis
- Dementia
- Parkinson' diseases
- Alzheimer's disease

b) Food Allergy and Food Intolerance
Immunological basis, Clinical features, Diagnosis & MNT

c) Recent advances in etiopatho-physiology, clinical and metabolic aberrations, diagnosis, complications, treatment and MNT – Prevention and dietary counseling in :

- Cancers – general and specific
- Effect of therapy on MNT

UNIT IV: Pediatric Nutrition Care and Management 10

- Management of severely acute malnourished (SAM) children – Nurition Care
- Inborn errors of metabolism : PKU, MSUD, galactosemia, tyrosinemia
- Congenital anomalies and congenital heart disease

RECOMMENDED READINGS

- Mahan, L. K. and Escott Stump. S. (2008) *Krause's Food & Nutrition Therapy 12th ed.* Saunders-Elsevier
- Garrow, J.S., James, W.P.T. and Ralph, A. (2000) *Human Nutrition and Dietetics. 10th ed.* Churchill Livingstone
- 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.
- William's Basic Nutrition and Diet Therapy. 13th Edition. Stacy Nix (2009) Elsevier Mosby.
- Koletzo B.(Ed) (2008) Pediatric Nutrition in Practice. Karger.

- Dorland WA Newman. (2003) *Dorland's Illustrated Medical Dictionary. 30th ed*. WB Saunders Co.

PERSPECTIVES IN FOOD AND NUTRITION SECURITY

THEORY

Paper No. : 0213
Maximum Marks : 100
Teaching Periods : 4/week
Teaching Load : 48-50 periods/semester

OBJECTIVES

1. To understand the concept of Nutrition Security
2. To be familiar with the various approaches and strategies for combating malnutrition
3. To understand the various Government programs and policies aimed at improving the health and nutritional status of the population.
4. To be able to plan, implement, monitor and evaluate nutrition programmes.

CONTENTS **PERIODS**

UNIT I: Population Dynamics **4**

- Demographic transition
- Population structure – implications on quality of life
- Population policy

UNIT II: Food and Nutrition Security **12**

- 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
- Disaster management
- Economics of Malnutrition

UNIT III: Approaches and Strategies for Improving Nutritional and Health Status **12**

- 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 IV: Nutrition Policies and Programs **10**

- National policies on health and nutrition
- National Health and Nutrition Programs – their administration and evaluation

UNIT V: Nutritional Surveillance **5**

- Definition, objectives, purposes and indicators

UNIT VI: Program Planning **5**

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

RECOMMENDED READINGS

- Gibney M.J., Margetts, B.M., Kearney, J.M. Arab, I. eds (2004) *Public Health Nutrition*, NS Blackwell Publishing.
- Jelliffe, D. B and Jelliffe, E.F.P. (1989) *Community Nutritional Assessment*, Oxford University Press.
- Owen, A.Y. and Frankle, R.T. (1986) *Nutrition in the Community. The Art of Delivering Services*, 2nd ed. Times Mirror/Mosby.
- Park.K. (2009) *Park's Textbook of Preventive and Social Medicine*, 20th ed. M/s Banarsida Bhanot, Jabalpur.
- Wadhwa, A. and Sharma, S. (2003) *Nutrition in the Community*. A text book. SCN News, UN ACC/SCN Subcommittee on Nutrition

FOOD SERVICE MANAGEMEMT & FOOD MICROBIOLOGY

THEORY

Paper No. : 0214
Maximum Marks : 100
Teaching Periods : 4/week
Teaching Load : 48-50 periods/semester

OBJECTIVES

1. To develop a knowledge base about the physical facilities needed for different types of food service units
2. To impart necessary expertise to manage the financial aspects in the units.
3. To get brief knowledge about various groups of microbes.
4. To understand the importance of microorganisms in food i.e. food spoilage, food fermentation and causing food borne infections.
5. To gain knowledge about the techniques used for cultivation and purification of microbes
6. To know about the concept of food safety and quality control.
7. To provide practical experience in maintenance of sanitation and safety in units.

CONTENTS **PERIODS**

UNIT I: SPACE AND EQUIPMENT **8**

- Layout planning:
  Preliminary preparation-Information gathering , Prospects
  Determining basic units and equipment
  Design development.- Types of kitchen areas , Flow of work and work area relationship
- Determining equipment needs
  Types of Equipments
  Features of equipments
  Factors affecting selection of equipments
  Equipment needs for different situations
- Architectural considerations for a Food Service Establishment
- Feasibility assessment in terms of layout design and costs

UNIT II: FINANCIAL MANAGEMENT **14**

- Importance of Financial Management in a food based enterprise
- Budgets and Budgeting process
- Records: Menu, Purchase, Store, Production, Sales, Personnel, Utilities
- Reports : Cost analysis: Concept of Trial Balance, Profit and Loss Account ,Balance sheet
- Food cost analysis , profit and loss statement, Basic concepts in accountancy : Cash memo, Receipt, Pay-in-slip, Cheques, Vouchers, Books of Account: Journal, Sales Return Book, Purchases Return Book, Sales Book, Purchase Book, Cash Book, Ledger
- Pricing and its methods Costing: concepts and controlling techniques; cost effective procedures, Concept of Break Even Point (BEP)

UNIT III: FOOD CONTAMINATION AND SPOILAGE

- Growth requirements and nutritional types of microorganisms – Photoautotrophs, photoheterotrophs, chemoautotrophs & chemoheterotrophs **3**
- Factors affecting growth- Temperature, pH, oxygen and water activity **2**

- Sources of food contamination- A general account **3**
- Spoilage of some important foods: Milk, Fruits and Vegetables, Canned food and Meat **7**

UNIT IV: IMPORTANCE OF MICROORGANISMS IN FOOD

- Importance of microbes in food biotechnology: fermented foods, **2**
- Food borne infections and intoxications: Definition, symptoms and prevention (*Salmonella typhi, Clostridium botulinum)* **3**
- General account of Microbial toxins – Exotoxins, endotoxins, mycotoxins **2**

UNIT V: FOOD HYGIENE, SANITATION AND SAFETY **6**

a) Importance of hygiene and sanitation in food service organization
b) Sanitation measures for Food , Personal and Unit Hygiene
   Training food service personnel in Sanitation.
c) Safety- needs, causes of accidents and types, safety techniques,
   3 Es of Safety
d) Food laws/Food bill- FPO, ISI, AGMARK, PFA, New Food Bill 2006
e) Quality standards - HACCP, ISO

RECOMMENDED 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.
- Sethi Mohini (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
- Leslie Chadwick (1996) The Essence of Financial Accounting 2nd ed Prentice Hall of India Ltd
- Roday .S (2003**)** Food Hygiene & Sanitation , Tata Mc Graw Hill publication Ltd

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- Frazier WC, Westoff DC. (1998)*Food Microbiology. 4th ed*. Tata McGraw-Hill Publishing Co. Ltd.
- Garbutt John (1997) *Essentials of Food Microbiology*. Arnold London.

PRACTICAL – Semester II

Paper No. : 0215
Maximum Marks : 100
Teaching Periods : 10/week

Course A: Therapeutic Nutrition II

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals / semester

OBJECTIVES

Equip students for

1. Planning and preparation of therapeutic diets for various diseases / disorders

2. Dietary counselling for prevention and treatment of various diseases / disorders
3. Application of computers for nutrition care
4. Developing special dietetic foods

CONTENTS	PRACTICAL SESSIONS
UNIT I: Planning and preparation of diets for disorders covered in theory	**8**
UNIT II: Diet counseling and preparation of counseling aids	1
UNIT III: Dietetic food product development for various disorders	**2**
UNIT IV: Application of computers for nutritional care	**1**

Course B: Perspectives in Food and Nutrition Security

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals / semester

OBJECTIVES

1 To be familiar with ongoing national nutrition programmes
2 To plan and implement interventions for nutritional improvement of the community

CONTENTS	PERIODS
UNIT I: Planning and preparation of cyclic menu for a school feeding program	**3**
UNIT II: Planning and preparation of diet for PEM	**2**
UNIT III: Field visits to ongoing National Nutrition Programs	**1**
UNIT IV: Development of a plan for nutrition education program in community. Preparation of communication aids for different groups. Implementation of program in community	**6**

Course C: FOOD SERVICE MANAGEMENT & FOOD MICROBIOLOGY

Practical

Teaching Periods : 3/week (1 practical)
Teaching Load : 12 practicals / semester

OBJECTIVES

1. To understand the importance of layout and equipment in food service units
2. To impart necessary skills to function as food service manager
3. To assess the safety and sanitation of food service units
4. To manage a canteen or other enterprise

CONTENTS **PRACTICAL SESSIONS**

Unit I: Field visits to institutions to study layout and sanitary operations **2**

Unit II: Demonstrations of processing techniques/ cuisine **1**

Unit III: Recipe development for (any one)
Healthy options, party foods, packed meals **2**

Unit IV: Catering management (any two) **3**

- Canteen
- Food Stall
- College event catering

Unit V: Food Microbiology **4**

- Use of different sterilization and disinfection techniques in microbiology- Heat (moist and dry), radiations (laminar flow), filtration (membrane filters), and alcohols
- Investigating presence and enumeration of bacteria in samples (water and milk) by plate count, MPN and MBRT
- Assessment of Sanitation and Hygiene of the Hostel Mess and College Canteen by using Swab and Rinse technique

Course D: Seminar

Teaching Periods : 1/week
Teaching Load : 12 periods / semester