PSG College of Arts & Science

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M.Sc.
CLINICAL NUTRITION AND DIETETICS

2017 - 2019

MSc., Clinical Nutrition and Dietetics
Scheme of Examination
(For students admitted in June 2014 – 2015 & onwards)

Code No.	Subject	Dura-tion (Hrs)	Max. Marks			Credit Points
			CA	CE	Total	
First Semester						
14CNP01	Community and Public Health Nutrition	3	25	75	100	4
14CNP02	Human Physiology	3	25	75	100	4
14CNP03	Biostatistics and Research Methods	3	25	75	100	4
14CNP04	Applied Nutrition	3	25	75	100	4
14CNP05	Nutrition in Clinical Care I	3	25	75	100	4
14CNP06	Community Nutrition Practical	3	40	60	100	3
14CNP07	Nutrition in Clinical Care - I Practical	3	40	60	100	3
Second Semester						
14CNP08	Clinical Biochemistry	3	25	75	100	4
14CNP09	Nutrition in Clinical Care II	3	25	75	100	4
14CNP10	Health Care Management	3	25	75	100	4
16CNP11	Clinical Biochemistry Practical	6	40	60	100	3
14CNP12	Nutrition in Clinical Care II Practical	3	40	60	100	3
14CNP13A 14CNP13B	**Core Elective I:** Medical Microbiology OR Food Microbiology	3	25	75	100	5
14SBP01	**Skill Based Subject :** Cyber Security	-	100		100	2

Cont ..

Code No.	Subject	Dura-tion (Hrs)	Max. Marks			Credit Points
			CA	CE	Total	
Third Semester						
14CNP14	Nutraceuticals and Drug Interaction	3	25	75	100	4
14CNP15	Food Service Management	3	25	75	100	3
14CNP16	Clinical Health Psychology (Allied – PS)	-	100	-	100	3
14CNP17	Hospital Posting	-	100	-	100	10
	Core Elective II:					
14CNP18A	Health and Fitness	3	25	75	100	5
	OR					
14CNP18B	Integumentary Nutrition					
	Cluster IDC:					
14CNP19A	Food and Medicinal Resources (BO)	3	25	75	100	4
	OR					
14CNP19B	Silkworm Rearing (ZO)					
	OR					
14CNP19C	Foods, Gene and Diseases (BT)					
Fourth Semester						
14CNP20	Hospital Internship	-	200	-	200	10
	OR					
	Project	-	80	120	200	
Subtotal						90
Certificate course in Yoga therapy						4
				Total Credit		**94**

Certificate course in Yoga Therapy in II & III semesters (80 hours) - 4 credits
Total 94 credits to earn their degree

CLUSTER IDC offered by the Department

14BOP16B/14ZOP17B/14BTP18C Nutrition for Life Style Disorders (for MSc Botany, MSc Zoology & MSc Biotechnology)

14CNP01 Community and Public Health Nutrition (4 hrs / week)

Objectives

To enable the students to

1. Relate nutrition and health in the community
2. Assess the health status of the community
3. Keep abreast to the changes in health care administration and policies

Unit I: Community Health and Nutrition (10 hrs)

Health and community health - definition, concepts of community health – biomedical, ecological, psychological and holistic, Determinants of health, Indicators of health

Epidemiology – Definition, methods of epidemiological studies – retrospective study, prospective study, case control study, cohort study, randomized control trials, non-randomized control trials

Bionetwork of malnutrition –Epidemiology, consequences, ecological factors, clinical and biochemical parameters, prevention and cure of disorders - PEM, synergism between malnutrition and infection

Unit II Environment and Health (10 hrs)

Communicable diseases - Prevalence, pathophysiology, clinical features, control measures– chicken pox, measles, influenza, dengue, tuberculosis, typhoid, hepatitis, malaria, leptospirosis and AIDS

Occupational health hazards – Physical, Chemical and biological hazards - prevalence, prevention and control; Hazards in Industries- hospital, textiles, foundry, agriculture and radiation: Controlling measures
and legal provisions

Unit III Health administration in India (12 hrs)

Welfare Programmes – Maternal and child health (specific reference to immunization programme); Nutrition programmes; public nutrition approach to tackle nutritional problems; Policies and programmes of the government and NGO sector of vulnerable groups, Millennium Development Goals and indicators pertaining to nutrition like goals 1,4,5,6.

Health status in India (based on current statistics)- Definition, principles and objectives of community health administration and policy; Prevalence of lifestyle diseases in India; Nutritional health policy, Health care delivery system at central, state and district level (specific reference to PHC).

Health Agencies –UNICEF, FAO, UNDP,ILO, UN, UNESCO, WHO, USAID, CARE, World bank-
Functions and beneficiaries,.

Unit IV Emergency feeding (8 hrs)

Emergency situations arising from famine, earthquake, flood and tsunami; nutritional problems in emergencies, nutritional relief and rehabilitation – organizations involved food distribution strategies.

Unit V (8 hrs)

Assessment of Nutritional Status - Anthropometry, clinical examination, Biochemical estimation, functional indices; Biophysical methods; Biophysical methods; Diet survey, vital statistics and ecological factors; Functional assessment;

Nutrition Education - Aids for mass communication, small group communication; Identification,
selection, execution and evaluation of nutrition education programme for the community.

References

1. **Park and Park,** 2011, Community and Public Health Nutrition, 21st edition, New Age Publications, New Delhi,
2. **Dhaar GM and Robbani I**, 2008, Foundations of Community Medicine, 2006, 11th Edition, Saurabh Printers Pvt.Ltd, New Delhi
3. **Michael J. Gibney, Barrie M. Margetts, John M. Kearney, Lenore Arab**, Public Health Nutrition, 2004, 11th edition Wiley-Blackwell Publishers, USA.
4. **Johanna Dwyer,** Nutrition in the community: the art and science of delivering services, 1999, 4th edition, WCB McGraw-Hill, New York.
5. **Arlene Spark,** Nutrition in Public Health: Principles, Policies, and Practice, 2007, 1 edition, Hunter College, New York City, USA

14CNP02 **Human Physiology** **(5 hrs / week)**

Objectives

To enable the students to

1. Learn the anatomy of the different organs
2. Understand the functioning of the various systems

Unit I **(13 hrs)**

Cell - Description of a cell and its components (Self Study), function of a cell- synthesis, energy production and transport across cell membrane, Membrane Potential and Action potential

Immune system - Cell mediated and humoral immunity, antibody production, Immune deficiency diseases, auto immune diseases, allergy.

Unit II **(13hrs)**

Circulatory system - Heart & blood vessels-structure, blood flow - blood flow through cardio vascular system, (self study), Junctional tissues & transmission of impulse through heart muscle, cardiac cycle and output & heart rate, blood pressure; hemorrhage, heart failure, shock, hypertension.

Respiratory system-Review of structure and function (self study), mechanism of respiration - role of lungs in exchange of gases, cardio respiratory response to exercise, respiratory abnormalities – hypoxia, apnea, hypo and hyperventilation

Unit III **(10 hrs)**

Digestive system - Anatomy & physiology of alimentary canal (self study), mechanism of secretion of digestive juices, movements of GI tract, digestion and absorption, gastrointestinal hormones – sources and action.

Excretory system - Anatomy & physiology of kidney and nephron (self study), formation of urine, renal handling of individual substances – inulin, urea and para-amino hippuric acid, Dialysis

Unit IV **(14 hrs)**

Endocrine glands - structure (self study), role of hormones, regulation of hormonal secretions, underactivity and overactivity of endocrine glands, emphasis on stress hormones

Reproduction - structure of male and female reproductive system; Spermatogenesis and activity of oogenesis (self study), ovulation cycle and menstrual cycle; androgen, estrogen and progesterone, testosterone, menopause, infertility - causes

Musculo-skeletal system — structure and function of bones, cartilage(self study); muscles- Structure of Muscle Fiber, Types of Muscle Fiber, Adaptation of Muscle Fiber to activity; Mechanism of contraction of skeletal muscle, Disorders of skeletal system and muscles.

Unit V **(10 hrs)**

Nervous system - Structure of brain and spinal cord (self study); conduction of nerve impulses, role of neurotransmitters; afferent & efferent nerves, blood brain barrier, degeneration and regeneration of nerve fibers. EEG - principle & interpretation

Special senses - eye, ear, nose and taste buds – structure and mechanism of vision, hearing, smell and taste (self study); Pathway of vision, hearing, smell, and taste, Rhodopsin cycle; clinical disorders of eye, ear, nose and taste buds

References

1. **Sembulingam. K,** Essentials of Medical physiology, 2010, Jaypee Medical Publishers, NewDelhi
2. **Mackenna B.R., Callander. R** 1997, 6th Edition, Illustrated physiology, Churchill Livingstone Publications, Singapore
3. **William S. Hoar**, Physiology-, 1997, Prentice Hall, Inc/Englewood, New Delhi
4. **E. Rabsky, B.Khodorov, G.Kositskv, A. Zubkov,** Human physiology, Vol II, MIR Publishers, 1989.
5. **Shiriley R. Bruke R.N, A wiley,** Human Anatomy and Physiology for health sciences – medical pp, 1980.
6. **Sigmun Grollman**, Human body - its structure and physiology, 4th edition, Macmillan Pub, 1973.
7. **Dorothy S.Luciano, Arthur J. Vander, James H. Sherman**, Human function and its structure International student edition, Me Graw Hill pub.
8. **P.D Strukie**, Basic physiology, Springer - Verlag pub, 1981.
9. **Winter & Shourd,** Review of human physiology 1982, W.B.Saunders company publication, 2nd edition.
10. **Anil Baran & Singha Mahapatra,** 1999, Essentials of medical physiology, Current book international.
11. **G.K.Pal & Parvati Pal,** 2010, Textbook of Practical Physiology (New), India

14CNP03 BIOSTATISTICS AND RESEARCH METHODS (5 hrs/week)

Objectives

1. To enable the students to understand the research process
2. To familiarize the students with Statistical analysis
3. To learn the Statistical applications

UNIT I (8 hrs)

Meaning of research, objectives, motivation. Significance, criteria for good research and research process. Proforma construction. Observational studies, cross-sectional studies, cohort study, case control study design, randomized controlled trials.

UNIT II (8 hrs)

Research design, meaning need features of good design concepts. Types, basic principles. Developing a research plan. Data collection methods, measurement scale, Sampling methods, sample size determination, tabulation, presentation and diagrams. Report writing, article and abstract publication.

UNIT III (8 hrs)

Vital statistics- uses, mechanism of collection, basic formula for calculation, birth rate, mortality rate, morbidity rate, fertility rate.

Health statistics - uses, sources, measurement of sickness problems in collection of sickness data.

Hospital statistics- International classification of diseases.

UNIT IV (18 hrs)

Measures of Central Tendency - Measures of Dispersion. Simple Correlation and Simple regression – Simple problems - Multiple correlations and multiple regression analysis (Concept only) Probability Theory and Distributions (basic theoretical concepts only)

UNIT V (18 hrs)

Hypothesis testing: Z test for means, proportions, SD's and finding Confidence Intervals - 't' test for single mean and two mean - independent and Dependent samples - ANOVA – one way classification only. Chi- square test for independents of attributes and homogeneous

RERERENCES

1. **C.R. Kothari**, Research methodology- Methods & Techniques, 2004, 2nd Revised edition, New Age International (P) Limited, Publishers, New Delhi
2. **P.S.S. Sundar Rao & J.Richard**, 2006, An Introduction to Biostatistics and Research Methods, 5th edition, PHI Learning Pvt. Ltd, Biometry; Kindle edition, Amazon Whispernet
3. **Thomas F. Hetson**, Biostatistics and Epidemiology (Self assessment Series), Kindle edition, Amazon Whispernet
4. **Paul Cool**, Medical Statistics, Kindle edition, Amazon Whispernet
5. **S.P. Gupta**, 2011, Statistical Methods. Sultan Chand & Sons, New Delhi.

14CNP04 **Applied Nutrition** **(4 hrs / week)**

Objectives

To enable the students to

1. Study the importance of nutritional requirements throughout the life cycle
2. Know the development of the human being at different stages and
3. Learn the importance of nutrition in physical fitness

Unit I **(12 hrs)**

Recommended Allowances for Indians and basis of computation of the allowances for macronutrients and micronutrients (Self study)

Nutrition in Pregnancy - Physiology of pregnancy; maternal physiological adjustments, maternal weight gain; subjective and objective symptoms of pregnancy; Stages of human fetal growth, mechanism and regulation of fetal growth, Nutrient requirements during prenatal, perinatal and postnatal periods, High risk pregnancy - Teenage pregnancy, Anaemia, diabetes in pregnancy, pre-eclampsia and eclampsia, alcoholism, caffeine abuse and smoking and its complications and hyperemesis, under nutrition and its implications; Diet counseling for teenage and adult pregnancy;

Unit II **(12 hrs)**

Nutrition in Nursing - Physiology of lactation, hormonal control and reflex action, efficiency of milk production; frequency of nursing- supply and demand; Duration of exclusive breast feeding and its relationship to the development of immune system, oral motor development and gastro intestinal tract development; lactogenic foods, value of breast feeding and contra-indications to breast feeding; Nutrient requirements during lactation. Composition and comparison of human milk, cow's milk & infant formulae;

Nutrition in Infancy – Growth & maturation, Reference standards for growth and growth monitoring; Infant feeding - nutritional requirement of full term infants; breast feeding Vs bottle feeding; weaning practices;; feeding problems of normal infants. Sequence of development of feeding behaviour

Low birth weight and preterm infants- characteristics, growth, development, feeding practices, feeding problems, Strategies for reducing the incidence and severity of allergy in high risk infants

Unit III **(12 hrs)**

Nutrition in preschool age - Physical growth and development related to neuro muscular development (Self study), eating behavior, nutritional requirements of preschool children; factors influencing food choices, standard for growth monitoring

Nutrition in school children - Physical growth, height and skeletal maturation, weight and anthropometric measurement, Standards for growth monitoring (Self study), factors to be considered while planning a menu; feeding problems of underweight and hyper active children, dental caries; packed lunch and its effect on nutritional status. Nutritional related health issues in childhood.

Unit IV **(12 hrs)**

Nutrition during adolescence – Growth and development – physical growth and psychosocial development (Self study), physiological malnutrition, BMR, and body

Composition changes; Age at menarche, factors affecting menarche, psychological problems and challenges in adolescence, body image, weight control, skipping meals, anorexia nervosa, obesity, snacking, fast foods, sense of identity- addiction to cigarettes, alcohol and drugs. Nutritional problems in adolescence – iron deficiency anaemia, obesity and under nutrition - etiology, prevention and control, pubescent growth assessment

Unit V **(12 hrs)**

Nutrition during Adulthood –Physiological changes of adulthood – male- climacteric change, female – menopausal changes, Osteoporosis and Osteopenia; Factors influencing nutritional requirements of the adult;

Geriatric Nutrition - Ageing process - physiological, metabolic, body composition changes and impact on health and nutritional status, Nutritional and health status of elderly, Factors influencing food and nutrient intake, health status including lifestyle pattern, medication, psychosocial aspects etc, Chronic degenerative diseases and nutritional problems of the elderly - their etiopathogenesis, management, prevention and control.

References

1. **Worthington. S and Sue Rodwell Williams,** Nutrition Throughout the Life Cycle, 1996, Third Edition, The McGraw Hill, New Jersy
2. **Gail Goldberg, Elizabeth Dowler, Prakash Shetty,** Nutrition Through the Life Cycle, 2007, RSC publishing, London.
3. **Judith Sharlin, Sari Edelstein,** Essentials of Life Cycle Nutrition, 2010, I edition, Jones & Bartlett Publishers, London.
4. **Jim Mann & A. Stewart,** Essentials of human nutrition, 2002, II edition, Truswell, Oxford university press, New Delhi
5. **Myron Winick,** Nutrition and exercise, 1996, I edition, John Wiley & Sons publishing company, Singapore.
6. **Ira Wolinsky,** Nutrition in Exercise and Sport, 1997, III Edition, CRC press, United Kingdom.

14CNP05 Nutrition in Clinical Care -1 (4 hrs/week)

Objectives

To enable the students to

1. Know the etiology of different diseases
2. Understand the conditions of various diseases
3. Apply the knowledge in the dietary treatments of different diseases

Unit I (12 hrs)

Diet Therapy: Principles and objectives, role of dietitian in hospital and community, goals and policies of IDA, diet prescription, diet counseling- guidelines for dietary planning and use of exchange lists in nutrient calculation and menu planning -Routine hospital diets and modifications for different diseases or disorders

Nutritional Care Process: Subjective Global Assessment -Nutritional assessment of hospitalized patient -Identification of problems and planning of nutritional care - Implementation of nutritional care plan-evaluation of patient care.

Nutritional Support Techniques:

Enteral nutrition - Indications, enteral access - nasogastric route, nasoduodenal, nasojejunal route, percutaneous endoscopic jejunostomy (PEJ), percutaneous endoscopic gastrostomy (PEG), surgically placed enterostomies, enteral formula composition, enteral formula categories, administration, monitoring and complications, advantages; medication and enteral nutrition incompatibility

Parenteral nutrition - Indications for use of TPN, parenteral access, parenteral nutrition solutions, administration, monitoring and complications

Unit II (8 hrs)

Dietary Management in Energy Imbalance and Eating Disorders: Underweight and anorexia nervosa-Etiology and dietary management – bulimia – obesity – assessment, etiology and classification, metabolic alterations, complications

Dietary Management in Deficiency Diseases: PEM, vitamin A deficiency, calcium deficiency, anaemia (Monocytic, megaloblastic, microcytic, sickle cell, hemolytic) (Self study). EFA, Zinc and Selenium deficiency disorders

Unit III (8 hrs)

Nutrition in Pediatrics - Basic needs and plans of nutritional care of the hospitalized infant-Special infant needs - low birth weight, failure to thrive-Gastrointestinal problems of infancy & childhood - general functional disturbances, infantile diarrhea, celiac malabsorption syndrome, cleft palate and cleft lip, dental caries and nutrition support techniques

Dietary Management in Endocrinal Diseases: Hypo and hyperthyroidism- tetany-hypocalcemia

Unit IV (8 hrs)

Dietary Management in Febrile Conditions: Short duration (typhoid, malaria), Long duration (tuberculosis)

Nutrition for the Critically Ill Patients: New concepts of eucaloric / hypocaloric / hyper caloric feeding. Nutrition for AIDS patients – Etiology, symptoms, diagnosis, treatment and nutritional support

Unit V (10 hrs)

Dietary Management in Pulmonary Diseases and Musculo Skeletal Diseases: Chronic obstructive pulmonary diseases, asthma, Arthritis (osteo and rheumatoid), epilepsy

Dietary Management in Immune System Diseases: AIDS-Hypersensitivity (natural history and prevention)-Allergy, food allergens, antigen absorption, oral challenge procedures, immediate reactions to foods, celiac disease (gluten sensitive enteropathy), adverse reactions to MSG, asthma and food additives; nutraceuticals as immune-boosters and anti-inflammatory agents

References

1. **L. Kathleen Mahan, Sylvid Escott- Stump:** Karause's Food, Nutrition and Diet therapy, 201, 13th edition, W.B.Saunders Company.
2. **Laura E. Matarese, Michele M. Gottschlich**, Contemporary nutrition support practice: a clinical guide, 2006,11th edition, Saunders Elsviers Science, Missouri
3. **Scott A. Shikora, George L. Blackburn,** Nutrition Support: Theory and Therapeutics, 1996, I edition, International Thomas Publishing (ITP) online publishing –thomson.com
4. NIN, RDA for Indians, 2010
5. NIN, Nutritive value of Indian foods, 2010
6. Shills E. M., Olseon J.A and Skike M., Modern nutrition in health and disease, vol. I & II, 2000 and Febiger.
7. Philip Abraham, Antia F.P, Clinical nutrition and dietetics, 2004, Oxford University press.

14CNP06 **Community Nutrition Practical** **(5 hours /week)**

Objectives

To enable the students to

1. Assess nutritional status of different age groups
2. Enrich the knowledge on low cost locally available indigenous foods
3. Educate the population through counseling with audio visual aids.

Work instructions

- Development of Low cost nutritious recipes
- Anthropometric Measurement of infant - Length, weight, circumference of chest, Mid - upper arm circumference, precautions to be taken.
- Assessment of body composition using BIA.
- Comparison with norms and interpretation of the nutritional assessment data and its significance Weight for age, height for age, weight for height, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR).
- Growth charts - plotting of growth charts, growth monitoring and promotion.
- Clinical assessment and signs of nutrient deficiencies
- Estimation of food and nutrient intake - Household food consumption – using coefficient of consumer unit, 24 hours dietary recall, Weighment method, food diaries, food frequency questionnaire.
- Nutrition cum Health Education for rural population

14CNP07 Nutrition in Clinical Care - I Practical (3 hours / week)

Objectives

To enable the students to

1. Learn and apply the principles of dietary modifications
2. Plan diet for different disease conditions

I. Routine Hospital Diets

1. Clear Fluid Diet
2. Full Fluid Diet
3. Light Diet
4. Soft Diet
5. Bland Diet
6. Regular Diet

II. Diet for Critically Ill & Trauma Patients

1. Ryles tube feeding for critically ill patients
2. Diet for head injury
3. Diet for burns

III. Diet for Deficiency diseases

1. PEM
2. Vitamin A deficiency
3. Calcium deficiency
4. Anaemia
5. EFA deficiency

IV. Dietary Management in Fever & Diarrhea

1. Infantile diarrhea
2. Diarrhea in adults
3. Malaria
4. Dengue
5. Tuberculosis
6. Typhoid

I. Diet for Mentally Challenged Children

1. Autism
2. Learning Disability
3. Attention Deficit Hyperactivity Disorder
4. Hyperactivity

14CNP08 Clinical Biochemistry (5 hrs/ week)

Objectives

To enable the students to

1. Learn the metabolism of various nutrients
2. Understand the techniques of function tests and
3. Relate the implications of the function test

Unit I (10 hrs)

Enzymes - Definition, Classification of enzymes - Factors affecting enzyme activity, Enzymes in clinical diagnosis

Carbohydrates - Composition and classification (self study)- General metabolism – Glycolysis, TCA cycle, Glycogenolysis, uronic acid pathway, Gluconeogenesis and HMP Shunt, Glycogen storage diseases – clinical importance, regulation and hormonal influences of carbohydrate metabolism.

Unit II (12 hrs)

Lipids- Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of ketone bodies, Biosynthesis of fatty acids, Biosynthesis of cholesterol and regulation, Bile acids and their metabolism, Plasma lipoproteins - Composition, classification and functions, synthesis and Metabolism and significance.

Unit III (12 hrs)

Protein- Dynamic aspects of protein metabolism – Amino acid pool, nitrogen balance, catabolism of amionacids, Urea - formation and its clinical significance, Creatine and creatinine – synthesis, regulation, creatinuria,

Electron Transport Chain, Oxidative phosphorylation and Biological Oxidation

Electrolyte and Water - Acid Base Homeostasis, Blood buffer system and Metabolism in starvation.

Unit IV (12 hrs)

Nucleic Acids

Composition, classification, structure of DNA and RNA (Self study), Genetic code, transcription of genetic information and Protein Biosynthesis, DNA replication

Gene therapy –Definition, diseases of genetic origin, approaches to gene therapy; Introduction to Genetic engineering.

Unit V (14 hrs)

Function tests

Liver – liver function tests, diagnostic tests, detoxification, excretory test (two tests each)

Gastric Function Test

Test for malabsorption – Fat – Qualitative and quantitative analysis; Carbohydrate – D-xylose; Lactose breath test – lactose intolerance; Hydrogen test – H.Pylori; Schilling's Test – B12; Protein – Serum protein, albumin.

Cerebrospinal fluid - Composition, appearance, biochemical changes – clinical importance

Oncogenic markers – classification and clinical uses

Radioisotopes – diagnostic and therapeutic uses

Renal function Test - Biological functions of kidneys-manifestation of clinical symptoms (Self study), classification – glomerular filtration tests, renal plasma flow test, tubular function tests and other miscellaneous tests

Thyroid Function Test

Thyroid function – T3 and T4 and TSH, antibodies

Cardiac Function test

Tests used to estimate increased risk of cardio vascular disease, C-reactive protein, homocysteine and lipid profile

Radiological Investigations – ECG, ECHO, TMT, USG, CT, MRI, DEXA

References

1. **MN Chatterjee, Rana Shinde, T**extbook of medical biochemistry, 2007, seventh edition, Jaypee brothers medical publishers private limited, New Delhi.
2. **William J. Marshall, Stephen K. Bangert**, **Clinical Biochemistry, 2008.** metabolic and **clinical** aspects, II edition, ChurchHill Livingstone, London, United Kingdom.
3. **Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier,** 2007, Lippincott's Illustrated Reviews: Biochemistry, IV edition, Lippincott Williams Wilkins
4. **Carl A. Burtis, Edward R. Ashwood,** 1996, Fundamentals of clinical chemistry, 1996, 5th edition, W.B. Saunders Company, Pensylvania.
5. **Harold Varley**, 1988, Practical Clinical Biochemistry, 6th edition, Heinemann medical, London.
6. **Allan Gaw, Michael J. Murphy, Robert A. Cowan**, 1999, **Clinical biochemistry**: an illustrated colour text, II edition, Church Hill Livingstone, London, United Kingdom.

14CNP09 **Nutrition in Clinical Care – II** **(5 hrs/week)**

Objectives

To enable the students to

1. Understand the etiology and type of dietary modifications.
2. Be aware of the principles of alternative intervention.

Unit I **(12 hrs)**

Nutrition Therapy for Upper Gastrointestinal Tract Disorders: Oesophagus – Esophagitis/ esophageal reflux syndrome/ achlasia - stomach - dyspepsia, hiatus hernia, hypochlorhydria, acute and chronic gastritis, peptic ulcer, and gastric ulcer.

Nutrition Therapy for lower gastrointestinal tract disorders: Intestines - Flatulence, constipation (atonic, spastic and obstructive), diarrhoea (acute and chronic), steatorrhoea colon - inflammatory bowel disease - crohn's disease, ulcerative colitis, irritable bowel syndrome, short bowel syndrome, colon cancer, diverticular disease - diverticulosis, diverticulitis, tropical sprue, polyps, fissures. Post operative feedings for gastric, intestinal surgeries and cholecystectomy

Unit II **(12 hrs)**

Nutrition Therapy for Liver, Gallbladder and Pancreatic Disorders: Liver – Acute liver failure; neonatal hepatitis, Acute viral hepatitis, alcoholic liver disease, cirrhosis, hepatic encephalopathy, post liver transplantation. Wilson's Disease and Hemochromatosis Gallbladder-cholelithiasis, cholecystitis. Pancreas - acute and chronic pancreatitis.

Nutrition Therapy for Diabetes Mellitus: Etiology, types, symptoms, diagnosis - Newer diagnostic criteria,, metabolic alterations, complications, treatment, influence of drug and exercise, dyslipidemia in diabetes mellitus, carbohydrate load, artificial sweetners, fat substitutes. average blood sugar, advanced glycation end products (AGE), Blood glucose control and metabolism in DM and monitoring of clinical and biochemical parameters,

Unit III **(12 hrs)**

Nutrition Therapy for Cardiac Diseases: Congestive heart failure, coronary heart disease, atherosclerosis, hypertension, hyperlipidemia, Cardiometabolic Syndrome, Hyperurecemia, role of antioxidants.

Nutrition Therapy for Renal Disorders: Nephrotic Syndrome, pylonephritis, acute and chronic renal failure, dialysis, renal calculi- types and role of diet; urolithiasis, end stage renal disease, transplantation.

Unit IV **(14 hrs)**

Nutrition Therapy for Metabolic Stress: Metabolic response to stress, hormonal and cell – mediated response, nutrient assessment, head injury - nutritional support, systemic inflammatory response syndrome (SIRS), Respiratory distress syndrome, sleep apnea, dyspnoea. Burns — Estimation of extent of injury or sepsis, metabolic changes, nutritional support, various nutrients, Pre and post operative nutritional care, post surgical feedings for head and neck surgeries

Unit V **(10 hrs)**

Nutrition Therapy for Neoplastic Diseases: Types, etiology, clinical manifestation, dietary management, nutritional effects of cancer therapy, role of antioxidants.

Dietary Management in Inborn Errors of Metabolism- Gout, Phenyl ketonuria-galactosemia, fructose and lactose intolerance, glycogen storage disorders

References

1. **L. Kathleen Mahan, Sylvid Escott- Stump:** Karause's Food, Nutrition and Diet therapy, 2012, 12th edition, W.B.Saunders Company.
2. **Laura E. Matarese, Michele M. Gottschlich**, Contemporary nutrition support practice: a clinical guide, 2006, I edition, Saunders Elsviers Science, Missouri
3. **Scott A. Shikora, George L. Blackburn,** Nutrition Support: Theory and Therapeutics, 1996, I edition, International Thomas Publishing (ITP) online publishing –thomson.com
4. **NIN,** RDA for Indians, 2010
5. **NIN**, Nutritive value of Indian foods, 2010
6. **Shills E. M., Olseon J.A and Skike M**., Modern nutrition in health and disease, vol. I & II, 2000 and Febiger.
7. **Michele M. Gottschlich**, The Science And Practice Of Nutrition Support: A Case-Based Core Curriculum, 2007, I edition, American Society of Parenteral and enteral Nutrition (aspen)
8. **Annalynn Skipper,** Dietitian's Handbook of Enteral and Parenteral Nutrition, 2012, I edition, An ASPEN Publication
9. **Antia F.P,** Clinical nutrition and dietetics, 1997, Oxford University press

14CNP10 **Health Care Management** **(5 hrs/week)**

Objectives

1. To understand the processes and details related to effective patient care and to further increase the satisfaction levels of patients
2. To enable the students gain insight of both clinical and non clinical services in a hospital
3. To understand the processes and details related to effective patient care and to further increase the satisfaction levels of patients

Unit I **(12hrs)**

Hospitals in India

History of Indian Hospitals; Classification, organization and Functions of Hospitals; Role of health services in improving health; Planning a modern hospital – location, market survey, financial planning, minimum requirements, bed distribution, constructional and staff requirement.

Unit II **(12hrs)**

Hospital Administration

Hospital administrator – role, functions, skills and legal matters; Role and responsibilities of CEO, HODs of HR, Finance, Nursing, Emergency medical services, Stores, Dietetics, Public Relations Office, Information Office.

Hospital Committees

Administrative, Medical Board, Medical Ethics and Legality, Medical Audit, Infection Control, Hospital Advisory Committee.

Unit III **(12hrs)**

Hospital Management – Principles, Practice, Modern Techniques, Strategic Planning Process; Management by Objectives - Basic ingredients, Process, concept and advantages

Legal Aspects of Health Care – Patient and Consumer Protection Act, 1986; RTI 2005; The Prenatal Diagnostic Techniques Act, 1994; Transplantation of Human Organs Act, 1994; Biomedical waste Management and Handling Rules, 1998; MTP Act 1971,2002;

Accreditation- Definition, Advantages, list of organizations – ISO, JCI, NABH

Unit IV **(12hrs)**

Medical Records - Characteristics, functions, components, Technology advancement – EMR, Microfilming and smart cards; legal aspects of medical records

Standard Operating manual for Patient Care & Health Professionals- Emergency Department, ICU,OPD, IPD and Dietary.

Counselling – steps, types, functions and techniques.

Unit V **(12hrs)**

Current Issues in Healthcare –; Telemedicine; Health Tourism; Health Insurance; Biomedical waste management – types of waste, health hazard, color coding, disposal of waste; Disaster management- Pre disaster planning, triage of patients and Rapid Treatment System.

Text Books

1. Sharma DK and Goyal RC, Hospital Administration and Human Resource Management, PHI Learning Private Limited, New Delhi, Fifth Edition, 2010.
2. Syed Amin Tabish, Hospital and Health Services Administration – Principles and Practice, Oxford University Press, New York, Fourth Edition, 2011.

References

1. Kieran Walshe and Judith Smith, Health Care Management, Tata McGraw Hill Education Private Limited, New Delhi, First Edition, 2010.
2. Srinivasan AV, Managing a Modern Hospital, Response Books, NewDelhi, Second Edition, 2008.
3. Joydeep Das Gupta, Hospital Administration and Management – A Comprehensive Guide, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, First Edition, 2009.
4. Stephen P. Robbins and Mary Coulter, Management, 2009, II edition, Prentice Hall of India Pvt. Ltd., New Delhi
5. Elaine La Monica, Management in Health Care, 2005, II edition, Macmillan Press Ltd, London
6. Rodney M.Coe**,** 1970, Sociology of Medicine, McGraw Hill, Inc.
7. Rosalie Rebollo Pratt Ruth Lubbers, Hospital arts: a sound approach, 1997, I edition, Barcelona Publishers, New York.
8. Frank M. Pierson MA PT, Sheryl L. Fairchild BS PT, 2005, II edition, Principles and techniques of patient care, Saunders Elsevier, UK
9. Stephen M. Shortell, Arnold D. Kaluzny**,** 2006, V edition, Health care management: organization design and behavior, Thomson Delmar Learning, New York.

16CNP11 **Clinical Biochemistry Practical** **II semester**
(5 hours/ week)

Objectives
To enable the students to
1. Develop skills in estimation of metabolites
2. Learn various analytical techniques

I. Qualitative tests
- Inorganic constituents
- Organic constituents
- Abnormal constituents
  - Sugar
  - Ketone Bodies
  - Protein
  - Bile Pigments

II. Quantitative Estimation of the following using Kits
- Acid phosphatase
- Alkaline Phosphatase
- Bilirubin
- Urea - Blood & urine
- Blood Glucose
- Cholesterol
- Amylase - Serum & Urine
- Creatinine - Serum & Urine
- Phosphorus - Serum & Urine
- Aspartate Transaminase (AST) / Serum Glutamate Oxaloacetate Transaminase (SGOT)
- Alanine Transaminase (ALT) / Serum Glutamate Pyruvate Transamianse (SGPT)
- Triglycerides
- Total Protein – Albumin Globulin ratio
- Uric Acid

14CNP12 Nutrition in Clinical Care – II Practical (3 hrs/week)

Objectives- To enable the students to

1. Learn and apply the principles of dietary modifications
2. Plan diet for different disease conditions

I. Dietary Management in Upper Gastro Intestinal Tract Disorders

1. GERD with CVD
2. GERD with Diabetes
3. GERD in Elderly
4. GERD with Cholelithiasis and 5. GERD in pediatrics

II. Dietary Management in Lower and Upper Gastro Intestinal Tract Disorders

1. Partial Resection of Small Bowel
2. Partial Resection of Gastric region
3. Jejunal Resection
4. Illeal Resection
5. Colonostomy
6. Coeliac Disease
7. Diverticulosis
8. Hiatus Hernia
9. Acute Pancreatitis
10. Irritable Bowel Syndrome
11. Irritable Bowel Disorder
12. Constipation- Hyperthyroidism & Diabetes

III. Dietary Management for Diabetes Mellitus

1. Diabetes with Obesity
2. Gestational Diabetes
3. Diabetes with CVD
4. Diabetes with Hypertension
5. Diabetes with Nephropathy
6. Type-1 Diabetes Mellitus

IV. Dietary Management in Liver Disorders

1. Acute Hepatitis
2. Chronic Hepatitis
3. Liver Cirrhosis
4. Hepatic Encephalopathy

VI. Dietary Management in Cardiac Disease

1. Acute Myocardial Infraction
2. CVD for Hypertension
3. CVD with COPD
4. CVD with Hyperlipidemia
5. Congestive Cardiac Failure
6. congestive Cardiac Failure with Hypertension
7. Essential Hypertension

VI. Dietary Management in Genito Urinary System Disease

1. Type-1 Nephritis
2. Type-2 Nephritis
3. Acute Renal Failure with hyperkalemia
4. Chronic Renal Failure with hypokalemia
5. Renal Calculi (Urates)
6. Renal Calculi (Oxalates) and 7.Renal Calculi (Carbonates & Phosphates)

14CNP13A **Core Elective - I Medical Microbiology**

(5 hrs / week)

Objectives

To enable the students to

1. Learn about morphology and life cycle of different microorganisms
2. Know about the system wise infections
3. Identify the causative organisms and learn treatment measures

Unit I **(12 hrs)**

Basics and Morphology

Basic morphology, physiology and growth of Bacteria, Viruses, Fungi and Parasites

Hygiene – basic principles, Antisepsis, Antibiotic, Bactericidal agents

Immunology – Definition, six types of immune reactions, diagnosis and therapeutic uses

Nosocomial Infections

Burns, wounds, bacteremia, surgical site infection and UTI (Both Lower & Upper) - causative, pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment

Unit II **(12 hrs)**

Respiratory Infections

Chicken pox, Influenza, Measles, Streptococcal diseases, Tuberculosis, – causative, pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment

Unit III **(12 hrs)**

Intestinal Infections

Virus – Viral gastro enteritis, Hepatitis A - E, Poliomyelitis - causative pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment

Parasites – Amoebiasis, Giardiasis, tapeworm and round worm infections – causative, pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment

Unit IV **(12 hrs)**

Intestinal Infections

Bacteria – Cholera, Shigellosis, Staphylococcal food poisoning, Traveler's diarrhea, typhoid fever, Botulism, Campylobacter jejuni, gastro enteritis – causative, pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment

Unit V **(12 hrs)**

Other common Infections

Malaria, Filariasis, Meningitis, endocarditis, Dengue, Chickungunya, H1N1, Leptospirosis, HIV, Cysticercosis, hide angle cysts, Osteomyelitis, Skin infection, Fungal disease – opportunistic and superficial mycoses – causative, pathogens, clinical features, laboratory diagnosis, prophylaxis and treatment.

References

1. ***Stuart Walker. T**, Microbiology, 1998, W.B. Saunders Company, United States.*
2. **Anantha Narayanan R and C.K. Jayaram Panikar,** Textbook of Microbiology, 1994,5th Edition, Orient Longman.
3. **Jawerts E.J.I, Melnio S.E.A,** Adelberg 1998, Review of Medical Microbiology, Large Medical Publication, U.S.A
4. **Chakraborty P**, 1995, A textbook of microbiology, New Central Book Agency Pvt Ltd, Calcutta.

14CNP13B **Core Elective - I Food Microbiology**

(5 hrs/week)

Objectives

1. To enable the students to understand microbial spoilage of foods.
2. To provide the students a basic information regarding food born diseases.

Unit – I **(12hrs)**

History and scope of food microbiology – Historical development in food preservation, food spoilage and food poisoning.

Microbial growth pattern– Growth curve of microbial cultures, its application to food preservation.

Factors affecting microbial growth – pH, moisture content, Eh, nutrient content, antimicrobial constituents, biological structures, extrinsic factors.

Control of microbial growth in foods – High temperature, freezing, refrigeration, chemical preservatives, irradiation.

Unit – II **(12hrs)**

Types of microorganism associated with food – Mold-general characteristics, morphological features, reproduction, physiological requirements, common molds associated with foods.

Bacteria – Morphological, physiological characteristics, important food spoilage and pathogenic bacteria, associated with foods.

Yeast - General Characteristics, reproduction, cultural characteristics, physiological characteristics.

Viruses - Structure and replication with particular reference to food born viruses.

Biochemical changes caused by micro organisms – Degradation of carbohydrates, fermentation,
degradation of lipids, degradation of proteins and amino acids, putrefaction.

Unit – III **(12hrs)**

Microbial contamination and spoilage of foods – Vegetables, cereals, pulses, oilseeds, milk and meat during handling, processing and storage

Microbiology of water - Microbiological quality of water. Analysis of water.

Spoilage of processed foods – Canned products, causes of spoilage, appearance of spoiled cans, types of
spoilage of canned foods by yeast, moulds and bacteria.

Unit IV **(12hrs)**

Food borne disease – Staphylococcal gastroenteritis, Botulism, Listeriosis, Salmonellasis, Shigillosis.

Toxicants of microbial origins – Aflatoxins, ochratoxins, patulin, botulism, enterotoxins.

Detection of food borne pathogens - Physical, chemical and immunological methods of detecting microbes in foods with special reference to Staphyllococcus, Clostridium, Lysteria, Yersenia, Salmonella,
Escherichia, Vibrio.

Unit V **(12hrs)**

Control of Microorganisms – Access, physical removal, heat, low temperature, low pH, organic acids, modified atmosphere, antimicrobial preservatives, irradiation and novel processing technologies

Microbiology in Food Sanitation – Bacteriology of water; sewage and waste treatment and disposal; good manufacturing Practices; HACCP; Microbiological criteria for foods; Control Agencies

References

1. **Frazier, W. C. and Westhoff, D. C. (**1988): 4th edition, Food Microbiology, MaGraw Hill Inc.
2. **Jay James. N**. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc
3. **Peleezar, M.I. and Reid, K. D.** (1978): Microbiology, McGraw Hill Company, New York.
4. **Benson Harold, J. (1990)** : Microbiological Application, Publishers, U.S.A.
5. **Colling, C.E. and Lyne, P.M**. (1976) : Microbiological Methods Butterworth. London.
6. **George J. Banwart** (2004), 2 nd edition CBS Publishers & Distributors
7. **Pelezar, M.J. and Chan, E.C.S. (Jr.**), 2000: Microbiology, Tata McGraw Hill Pub. Co., New Delhi
8. **G.K.Pal & Parvati Pal** Textbook of Practical Physiology (New),2010 , India
9. **Stanier R.Y., Adelberg E.A. and Ingraham J.L.** (1987) General Microbiology, 5th Edition. Macmillan Press Ltd.

14CNP14 Nutraceuticals and Drug Interactions (5 hrs/week)

Objectives

To enable the students to

1. Understanding of Pharmacology, Pharmacology Processes, and Nutraceutical
2. Rationale of various treatment processes (at an elementary level)
3. Appreciation of potential for drug – Nutraceutical interactions

Unit – I (12 hrs)

Introduction to Nutraceuticals - Definition, classification, differentiation between Nutraceuticals and functional foods and drugs. Approval process for Nutraceuticals in India and USA.

Biological Functions of Nutraceuticals - Routes of administration, pharmacokinetics and pharmacodyanmics of Nutraceuticals.

Unit II (12 hrs)

Overview of Drug Nutrient Interactions

A perspective on drug nutrient interactions**,** Influence of food or nutrient on drug disposition and effect, drug absorption with food, effects of specific foods and non nutritive dietary components on drug metabolism, nutrients that may optimize drug effect, dietary supplement interactions with medicine, dietary supplement interactions with nutrients.

Unit III (12 hrs)

Influence of Pharmaceuticals on Nutritional Status

i) Cardiac drugs on nutritional status,

Antihypertensive drugs and nutritional status– beta blockers, ACE Inhibitors & Angiotensin receptor blockers, Calcium channel blockers, Vasodilators and anticoagulants

ii) Antiepileptic drugs on nutritional status,

iii) Diuretics and its interactions.

iv) CNS disorders - Pain Killers, Alcohol, General anesthetics and Sedatives on nutritional status

v) Antacids, anti ulcer drugs, purgatives and antiemetics on nutritional status.

vi) Hormone related drugs - Growth hormone, Thyroid hormone, Corticosteroids on nutritional status

vii) Oral diabetic drugs and Insulin on nutritional status

Unit IV (12 hrs)

Drug Nutrient Interactions in Specific Conditions

Drug nutrient interactions in patients with cancer, Drug nutrient interactions in transplantation, Drug nutrient interactions and immune functions, Drug nutrient interactions in patients with chronic infections. Anti microbial – nutrient interactions – an overview

Unit V (12 hrs)

Drug Nutrient Interaction in Special Nutrition Support

Drug nutrient interaction in enteral nutrition – nutraceuticals, functional foods, elemental and hydrolyzed diets, Drug nutrient interaction in parenteral nutrition – commercial formula; Role of probiotics;

References:

1. **Joseph I. Boullata and Vincent T. Armenti,** Handbook of Drug Nutrient Interactions, 2004, Humana Press, Nutrition and health (Totowa, N.J.) , New York, NY, 2010.
1. **K D Tripathi,** Essential of Medical Pharmacology, 6th Edition, 2008, JKB brothers and Distributors, Chennai.
2. **Katzung , B.G,** Basic and Clinical Pharmacology , 10th Edition, 2007, Mc Graw Hill Publications, Delhi
3. **Laster Packer and Klaus Kraner,** Nutraceuticals in Health and Disease Prevention, 2001, Peter-Paul Hoppe Publications, Germany.
4. **Bennet P.N,** Clinical Pharmacology, 10th Edition, 2008, Churchill Livingston (Elsevier) Publications, Philadelphia
5. **S.P. Maity and R.N. Chatterjee,** Pharmacology, 5th Edition, 2006, Books and Allied (P) Ltd., Calcutta
6. **W. Jeffrey Hurst,** Methods of Analysis for Functional Foods & Nutraceuticals, 2nd Edition, 2002, CRC Press, New York
7. **Robert E.C. Wildman,** Handbook of Nutraceuticals and Functional Foods, 2nd Edition, 2007, CRC Press, New York.
8. **Bertram G. Katzung, Susan B. Masters, Anthony J. Trevor,** Basic and Clinical Pharmacology, 11th Edition, McGraw Hill Professional, 2009
9. **Klaus Kramer, Peter-Paul Hoppe, Lester Packer,** Nutraceuticals in Health and Disease Prevention
10. **Peter N. Bennett, Morris J. Brown, Pankaj Sharma,** Clinical Pharmacology, 10th edition, 2009, Churchill Livingston (Elesiever) publications, Philadelphia
11. **Joseph I. Boullata and Vincent T. Armenti,** Handbook of Drug Nutrient Interactions, 2004, Humana Press, Nutrition and health (Totowa, N.J.) , New York, NY, 2010.

14CNP15 Food Service Management (3 hrs/week)

Objectives

To enable the students to

1. Understand the management aspects of food services
2. Develop skills in the management of human, material and financial and other resources
3. Gain knowledge of physical facilities in food services
4. Know the basic book keeping system and the principles of food cost control

Unit I (7hrs)

Management and Food Service Planning

Theories, principles and functions of management; Tools of management; Strategy of effective management; History of food services; Traditional food service system; Innovations in food service systems; Food service planning & management; Feasibility and design for food service operations; Catering Establishment Act; Food laws; Computer aided record maintenance and management.

Unit II (7hrs)

Management of Resources

Personnel: Development and policies; administrative personnel; non-professional; labor policies and legislation; human resource planning; recruitment, selection, induction, performance appraisal, training and development; Employee facilities and benefits;

Time And Energy: Measures for utilization and conservation;

Unit III (7hrs)

Quantity Food Production and Service

Menu - meaning, types, points to be considered while planning the menu, compiling simple menus; purchasing, receiving, storing and issuing of foods; food production methods; food production control; methods of food control; food control check list; food service methods and modes of delivery.

Unit IV (7hrs)

Physical Facilities

Equipment: Determining equipment, selection, purchase, placement and maintenance of equipment.

Layout of Facilities: Steps in planning layouts; design development – space allowances and relationships, schematic drawing and work areas.

Sanitation and Hygiene: Food hygiene, personal hygiene, environmental hygiene and sanitation.

Safety: Accidents-prevention and training, Hazard Analysis Critical Control Point (HACCP)

Unit V (8hrs)

Accounting and Records

Finance: Financial planning, financial operations - a system of records and reports; cost control - food cost control, labor cost control and overhead cost control.

Books Keeping: Journal, ledger, trial balance, balance sheet, profit and loss account.

References

1. **Mohini Sethi, Surjeet Malhar**, Catering Management; An integrated Approach, 2004, New Age International, New Delhi.

2. **Palacio JP, Harger V. Shugart G, Thesis, M**.,1994, West's and Wood's Introduction to Food Service, Prentice Hall, New Jersey
3. **Nancy Loman Scanlon,** Catering Management, 2007, IV edition, John Wiley & Sons, Inc, London.
4. **R K Malhotra,** Food Service and Catering Management, 1998, I edition, Anmol Publications, India
5. Sara E. Mortimore**,** Carol Wallace**,** Christos Cassianos**,** HACCP, 2001, Wiley-Blackwell, United Kingdom.
6. **Quality Enhancement in Food Processing Through HACCP**, 2002, Published by the Asian Productivity Organization

ALLIED

14CNP16 CLINICAL HEALTH PSYCHOLOGY

I SEMESTER

Objectives: To enable the student to understand…

- The concept and importance of Health Psychology in health care,
- The nature, cause and effects of stress and coping with stress,
- The nature and significance of pain and the ways to manage and control pain,
- The concept and various approaches of therapeutic counselling,
- The concept and application of psychological interventions.

PART – I – THEORY

UNIT – I INTRODUCTION TO HEALTH PSYCHOLOGY (11 Hours)

Health Psychology: Definition – Need for Health Psychology – Overview of the Systems of Body – **Current Perspectives on Health and Illness:** Bio-Psycho-Social – Life Span and Gender Perspective – Health related behaviour and Health Promotion

UNIT – II STRESS, ILLNESS AND COPING (8 Hours)

Stress: Meaning – Types - Bio-psycho-social aspects of stress – Sources – GAS Model of Stress - Effects on Health – **Illness:** Meaning - **Psycho-physiological Disorders** – **Coping with Stress** – Management of stress

UNIT – III PAIN AND ITS MANAGEMENT (8 Hours)

Pain: Meaning - Nature and Significance of Pain – **Managing and Controlling Clinical Pain:** Clinical Pain – Behavioural and Cognitive methods for treating pain, Hypnosis

UNIT – IV COUNSELLING (8 Hours)

Counselling: Meaning – Types – Counselling Process – Skills of an Effective Counsellor – **Therapeutic Counselling:** Psycho-social interventions for people with chronic conditions – Counselling for terminally ill.

UNIT – V PSYCHOLOGICAL INTERVENTION (11 Hours)

Psychotherapy: Meaning – **Various Approaches:** Behaviour Therapy – Bio-feedback - Rational Emotive Therapy – Psychoanalytic therapy – Existential therapy – Client Centered therapy – Expressive therapy – Music therapy.

PART – II

PRACTICALS (Internal only)

(Any THREE Practical has to be done and the student has to submit record for internal valuation)

PSYCHOLOGICAL ASSESSMENT (10 Hours)

1. Subjective Well-Being
2. Personality
3. Stress
4. Coping Skills
5. Perceived Loneliness

REFERENCES:

1. Sarafino, E. P. (2012): Health Psychology – Bio-psycho-social Interactions (7th Edition). New Delhi: Wiley India (P) Ltd.
2. Linda Brannon & Jess Feist (2010): Introduction to Health Psychology. New Delhi: Cengage Learning India (P) Ltd
3. Shelley C. Taylor, (2006): Health Psychology, (6th Edition), New York: Tata McGraw Hill Publication
4. Catherine A. Sanderson (2004): Health Psychology, New York: John Wiley & Sons Inc

14CNP17 **Hospital posting** **(10hrs/week)**

Objectives

1. To learn and familiarize with the signs, symptoms, complaints and therapeutic management of various disorders/diseases
2. To learn preparations and administration of special nutrition support
3. To assess and report the nutritional status of the cases

Work instructions

1. Going on rounds by the students posted in all the departments of hospital on rotation basis, with the Doctors
2. Study at least ten different cases and assess them on various nutritional parameters
3. Study the method of diagnosis of various diseases and the principles of dietary management , prescription of diet and diet counseling and report
4. Attending clinical meetings of the hospital to familiarize with clinical interpretations and presentations
5. Assessment of nutritional status of 10 cases and submission of report on hospital posting

14CNP18A **Core Elective – II Health and Fitness**

(4 hrs / week)

Objectives

The objectives are to

1. Learn the principles of wellness through physical fitness
2. Be motivated for a physically active life
3. Study the management techniques during exercise, sea voyage and at high altitude

Unit I **(8 hrs)**

Introduction to physical fitness & wellness – Objective of physical fitness, motivation for a physically active life – motivational strategies

Body composition assessment – Ponderal index, Quatlet index, Waist-Hip Ratio, Waist –Height Ratio, Bio impedance analysis, DEXA, Quantity ultra sonagraphy, Hydrostatic weighing, BOD-POD

Unit II **(12 hrs)**

Types of exercises, effect of exercise on muscular, skeletal, cardiovascular and respiratory activities, Energy balance, PAL (Physical Activity Level) equation, Energy system – Aerobic & Anaerobic, role of carbohydrates, fat and protein during exercise

Unit III **(10 hrs)**

Nutrition in Exercise - Preparation for competition, pre games meal, carbohydrate loading, pre exercise hydration, post game meal. Nutrition during exercise / games – fluid and carbohydrate intake, nutritional factors causing fatigue, fluid replacement, dietary supplements and ergogenic aids in sports.

High Altitude Nutrition - Acclimatization, hydration, nutritional problems and altitude sickness and dietary management

Space travel and nutrition – Space physiology, food system and dietary intake for space flight

Unit IV **(10 hrs)**

Oxidative stress and antioxidant requirements in trained athletes – oxidative stress, oxidative stress in exercise, antioxidants, oxidative stress and antioxidant defense, stress management techniques.

Unit V **(6 hrs)**

Physical fitness and life style management – smoking and alcoholism and drug addiction: Drug – Consequences of use, misuse and abuse, tolerance, dependence and addiction, legal drugs, psychoactive and vasoactive substances – occurrence, etiology, pathology and treatment, health related issues in coffee consumption, exercise and sleep apnea

Practical **(2hrs)**

Experiments

1. Estimation of daily caloric requirement
2. Assessment of Cardio vascular endurance
3. Assessment of Body composition
4. Estimation of body fat percentage through body monitor
5. Muscular strength and endurance assessment
6. Muscular flexibility assessment

14CNP18B **Core Elective - II Integumentary Nutrition**

(4 hrs / week)

Objectives

To enable the students to

1. enrich the knowledge of understanding skin, hair and nail
2. enhance the concepts of importance of nutrition in this systems
3. deliver a clear picture on the system

Unit I **(6 hrs)**

Integumentary Sysytem – Functions, major organs, structures and facts;Types – Cutaneous membrane and Accessory structures; Assessment of Skin, hair & nail – history, subjective, objective, physical, validation and documentation.

Unit II **(12 hrs)**

Skin- Anatomy of Skin, layers of the skin, Conditions of the Skin and Associated Structures Indicating Nutritional Deficiencies or Body Dysfunctions, Coloration of the Skin, Vascular Supply of the Skin, Aging of skin **Diseases of Skin -** acne, Wound healing, skin infections, Skin cancer, Alopecia, Boils and Carbuncles, Cold Sores (Fever Blisters),Impetigo (‘an attack’),Psoriasis (‘an itching’),Vitiligo (‘blemish’)

Unit III **(10 hrs)**

Hair - Anatomical structure of hair; Types of hair; Pathological impacts on hair; hair problems - Brittle or soft, Fungal-infections, Vertical ridged, White marks, Horizontal ridged.

Unit IV **(10 hrs)**

Nail – structure**,** Parts of the fingernail; nail problems - Dry, Brittle, Split ends, Greasy, Hair loss, Dandruff; diseases and disorders related to nutrition

Unit V **(10 hrs)**

Nutrition for Integumentary system - Nutritional factors responsible for skin, hair and nail - Low stomach acid, Smoking, Constipation, Exposure to chemicals and sun, Weak immune system, Dehydration, Poor diet, Menopause (women), Testosterone imbalance; Dietary and lifestyle recommendations.

References:

1. **Andrews, M., & Boyle, J.** (1999). *Transcultural concepts in nursingcare* (3rd ed.). Philadelphia: Lippincott Williams & Wilkins.
2. **Noronha, P., & Zubkov, B.** (1997). Nails and nail disorders in children and adults. *American Family Physician, 55*(6), 21–29
3. **Bryan . Anderson**. (2012). The Netter Collection of Medical Illustrations - Integumentary System: Volume 4, II edition, Netter Green Book Collection
4. www2.estrellamountain.edu/faculty/farabee/biobk/BioBook INTEGUSYS . html - **Farabee M.J (2001).**

14CNP19A FOOD AND MEDICINAL RESOURCES
CLUSTER IDC

45 hours

Aim: To gain the knowledge of morphology, distribution, active principles, and therapeutic uses of indigenous medicinal plants.

Unit-I

Conservation of Food Crops and Medicinal Plants, Assessment of Best Germplasms. Germplasm Multiplication. Botanical Status, Distribution, Mode of Consumption, Proximate Composition, Nutritional and Antinutritional factors of less known Pulses - *Bauhinia vahli* and *Mucuna pruriens.* **9 hours**

Unit-II

Botanical Status, Distribution, Mode of Consumption, Proximate Composition, Nutritional and Antinutritional Components of less known -

Millets – *Elucine indica.*

Vegetables - *Canavalia gladiata.* **9 hours**

Unit – III

Traditional Systems of Medicines, Classification of Medicinal Plants, Collection and Preparation of Natural Drugs for Marketing. Adulterants and Substitutions in Medicinal Plants. **9 hours**

Unit – IV

A General Account of Bioactive Substances - Basic Structural and Functional Aspects of Digestive and Cardiovascular Systems of Man. Botanical Identity, Distribution, Active Principle and Therapeutic uses of

Carminative and Gastro Intestinal Tract Regulators – *Coriandrum sativum* and *Piper nigrum.*

Cardiotonics and Antihypertensives – *Digitalis purpurea* and *Terminalia arjuna*

9 hours

Unit – V

Basic Structural and Functional Features of Respiratory System and Urino Genital System of Human Beings. Botanical Identity, Distribution and Therapeutic uses of

Antitussives and Expectorants – *Justicia adhatoda* and *Ocimum sanctum,*

Diuretics – *Tribulus terrestris* and *Boerhaavia diffusa.*

Antidiabetics – *Gymnema sylvestre* and *Cassia auriculata.* **9 hours**

REFERENCE / TEXT BOOKS

1. Trease and Evans (1978) Pharmacognosy, Cassell & Collier Macmillan publications, New Delhi.
2. Kumar, N.C An introduction to Medicinal Botany and Pharmacognosy. Emkay publications, New Delhi.
3. Gokhalae, S.B, Kokate, C.K and Purohit, A (2000). Pharmacognosy, Nirali prakhasam, Pune.
4. Atal C.K and B.M Kapur (1982). Cultivation and Utilization of Medicinal plants, RRL (SIR), Jammu Tawi.
5. Jain. J.L (1992) Fundamentals of Biochemistry. S. Chand & Co, New Delhi.

1. Stryer – Biochemistry- W.H. Freeman Company.

14CNP19B CLUSTER IDC – SILKWORM REARING (45 Hours)
THIRD SEMESTER

OBJECTIVES: To acquire knowledge about the biology of silkworm and the various rearing techniques. To know above the various techniques of propagating mulberry plants and to know about the various disease of mulberry and silkworms.

UNIT – I **(9 hours)**

Scope and importance of sericulture – species of silkworm – Description of mulberry plant-Propagation of mulberry plant-A brief account of mulberry varieties and planting methods, Irrigation methods.

UNIT – II **(9 hours)**

Macro, micro and bionutrients of mulberry- Deficiency diseases with particular reference to N, P, K, Fe and Bo.

Mulberry disease and Pests: Causative agents, symptoms and management of Root-rot, Powdery mildew, Tukra and Leaf miner.

UNIT – III **(9 hours)**

Morphology of mulberry silkworm: Egg, larva, pupa and adult.
Structure of silk gland and silk proteins.
Life –cycle of silkworm.

UNIT – IV **(9 hours)**

Silkworm seed production and incubation.
Rearing: Model rearing house, rearing appliances and mountage.
Rearing young age silkworm. Rearing Late-age silkworms.

UNIT – V **(9 hours)**

Disinfection of rearing house and equipments.
Silkworm diseases: Pebrine, Flacherie and Grasserie.
Silkworm: A brief account of life-cycle and management.
Cocoon types. Shell-ratio, Renditta and price fixation.
Cocoon marketing. A brief account on reeling process
By-products of sericulture.

REFERENCES:

1. Krishnasamy, S. New Technology of silkworm rearing. Central Sericulture Research and Training Institute, Mysore.
2. Krishnamsamy, S. Mulberry Cultivation in South India. Central Sericulture Research and Training Institute, Mysore.
3. Madan Mohan Rao, 1978. A Text Book of Sericulture. B.S. Publishers. Hyderabad.
Yoshemaro Tanaka, Sericology, Central Sericulture Research and Training Institute, Mumbai

14CNP19C **III Semester**

FOODS, GENES AND DISEASES **4 hrs/week**

Objectives:

- to study the relationship between food and health
- to understand the role of common dietary compounds on gene expression
- to understand dietary intervention based on knowledge of nutritional requirement, nutritional status, and genotype

Unit I **(9hours)**

Foods and genes: Genetics and epigenetic of bioactive foods, conventional and Indian traditional foods and food components, vitamins and minerals- antioxidant potentials; their role in preventing diseases, incidence of diet related diseases, influence of genes on dietary preference and tolerance, mucosal tolerance, Role of Selenium in oxidant and inflammatory process

Unit II **(9hours)**

Health Biomarkers: Identification and validation of compounds in tissues, blood and fluids; genetic screening for predisposition and occurrence in inflammatory diseases; genetic markers associated with increased risk for chronic disease, metabolic dysfunction.
Case Study: IGF rs680 polymorphisms in height variation in preadolescent children

Unit III **(9hours)**

Gene approaches for diseases: Nutrigenetics of myocardial infarction, Nutrient regulation of insulin gene, genetics in Crohn's disease, genetics and nutritional control of lipid metabolism, nutrigenetic approach to study obesity

Unit IV **(9hours)**

Diagnostics for diseases: Nutrigenomics for cancer detection, nutrigenomics in ageing, DNA polymorphisms, Microarrays to study gene expression , gene-nutrient interaction, Dietary signatures

Unit V **(9hours)**

Personalized medicine: Dietary indications for population health and wellness, vitamin and supplement products, genetic counseling, clinical trials to test food effects to demonstrate efficacy of food-health claims

Reference:

1. Nutritional Genomics: Discovering the path to personalized nutrition , Edited by Jim Kaput, 2013, Wiley
2. Nutrigenomics and Nutrigenetics in functional foods and personalized nutrition, Edited by Lynnette R Ferguson,2013, CRC Press
3. Genomics and proteomics in nutrition Edited by Carolyn D Berdeiner and Namia Moustaid Moussa, 2004, CRC Press
4. Dietary modulation of Cell Signaling pathways by Zigang Dong and Young Joon Surh, 2008, CRC Press

14CNP20 **Hospital Internship** **(6months)**

Objectives

To enable the students to

1. Undergo training -hand -on experience at the corporate hospitals under the sheer guidance of Registered/ 10years experienced dietitians for a period of 6months
2. Understand clinical and pathological conditions of various diseases/ disorders and planning diet prescription or dietary intervention for the same
3. Observe and study the food service management practices

Work Instructions

Each student is instructed to

1. Take up and report 8 case studies as per the RD Board recommendations in order to familiarize on various disorders and treatments

2. Do a mini project pertaining to the clinical situation via exploratory/ experimental studies

3. Submit the internship and project report

14BOP16B/14ZOP17B/14BTP18C Cluster IDC (4 hrs / week)

(For MSc., Zoology, Botany and Biotechnology)

Nutrition for Life Style Disorders

Objectives

To enable the students to

1. Study the importance of lifestyle disorders
2. Know the causative factors of lifestyle disorders and
3. Learn the importance of nutrition for prevention and management of lifestyle disorders

UNIT 1 - NUTRITION AND LIFESTYLE DISORDERS (12 hours)

Definition of Nutrition, balanced diet, Nutritional status, assessment of body composition, biology of adiposity, nature of foods, nutrients, RDA, energy balance, foods that lead to life style disorders.

UNIT 11 - NUTRITION AND WEIGHT MANAGEMENT (12 hours)

Malnutrition- Under weight and Obesity- Nutrients for Underweight conditions, Nutrition for management of obesity, Anorexia Nervosa and Bulimia nervosa, Hazards of Obesity, Obesity in Children, Strategies to overcome Obesity.

UNIT 111 - NUTRITION AND CARDIOVASCULAR DISEASES (12 hours)

Cardiovascular diseases- Atherosclerosis, Coronary Heart Diseases and Congestive Heart Failure, Hypertension, Hyperlipidemia and Dyslipidemia- Role of antioxidants, nutraceuticals and functional foods in cardiovascular diseases. Dietary management of cardiovascular diseases.

UNIT 1V - NUTRITION AND DIABETES MELLITUS (12 hours)

Definition of Diabetes Mellitus- Types- Etiological factors, Diagnosis and Complication of Diabetes Mellitus. Role of Nutraceuticals and functional foods in of Diabetes Mellitus. Dietary management of Diabetes Mellitus.

UNIT V - NUTRITION IN CANCER (12 hours)

Definition of Cancer- Types- Causative factors, Nutrients and Cancer- Detection and Treatment of Cancer- Role of antioxidants, Nutraceuticals and Functional foods in Cancer. Dietary treatment in cancer

References

1. **L. Kathleen Mahan, Sylvid Escott- Stump**: Karause's Food, Nutrition and Diet therapy, 2000, 10th edition, W.B.Saunders Company.
2. **Laura E. Matarese, Michele M. Gottschlich,** Contemporary nutrition support practice: a clinical guide, 2003,I edition, Saunders Elsviers Science, Missouri
3. **Scott A. Shikora, George L. Blackburn**, Nutrition Support: Theory and Therapeutics, 1996, I edition, International Thomas Publishing (ITP) online publishing –thomson.com
4. **NIN**, RDA for Indians, 2001
5. **NIN**, Nutritive value of Indian foods, 2001
6. **Shills E. M., Olseon J.A and Skike M.,** Modern nutrition in health and disease, vol. I & II, 1994 and Febiger.
7. Antia F.P, Clinical nutrition and dietetics, 1997, Oxford University press.
8. Michele M. Gottschlich, The Science And Practice Of Nutrition Support: A Case-Based Core Curriculum, 2007, I edition, American Society of Parenteral and enteral Nutrition (aspen)
9. Annalynn Skipper, Dietitian's Handbook of Enteral and Parenteral Nutrition, 1996, I edition, An ASPEN Publication

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