

HN&NC – 2015-2016

REVISED SYLLABUS

SEMESTER -I

11001 – BASICS OF HUMAN PHYSIOLOGY

UNIT - I

Cell Biology : Cell Structure, Cell theory, Cell cycle and functions of Cell membrane, Endoplasmic reticulum, Golgi apparatus, lysosomes, Mitochondria.

Digestive System: Composition & functions of salivary, gastric, intestinal & pancreatic secretions. Functions of bile salts, Mechanism of secretion of digestive juices and its regulation, movements of stomach, small intestine, villi, defecation. Liver – anatomy & physiology.

UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:

Blood; Introduction to hematology, functions of blood, functions of plasma proteins, erythrocytes and leucocytes, Hb, Important indices of RBC & WBC, Blood groups, ESR, blood viscosity, blood coagulation, Erythroblastosis foetalis, Blood transfusion.

Anatomical consideration of heart and CV system-special conducting tissues, properties of cardiac muscle, cardiac cycle, heart sounds, ECG & its interpretation, Heart rate & regulation. Cardiac output, hemorrhage. Compensatory changes after hemorrhage. Blood pressure, cardiovascular modifications during exercise. Different types of circulation- foetal circulation, pulmonary, hepatic, capillary. Techniques to identify cardiovascular disorders –angioplasty, angiogram.

UNIT III

Endocrine System: Endocrine secretions, glands, role and regulatory functions of endocrine, site of secretions, regulation of secretions. Mechanism of action of hormones.

Reproductive System: Male and female reproductive system-organs, structure and functions. Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization, conception, implantation. Male and female contraceptions - Etiology of male and female infertility.

UNIT IV

Nervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR,Regulation of re-absorption.

11005P-PRACTICAL

Section-A

1. Demonstration of measuring BP using sphygmomanometer.
2. Determination/Identification of blood group and Rh factor.
3. Determination of TC of RBC & WBC
4. Determination of DC of WBC
5. Determination of ESR
6. Estimation of Hb by Sahlis Method.
7. Measurement of clotting time of blood

REFERENCES

1. Chatterjee.C.C, Human Physiology (11th edition), vol 1 & 2, Medical Allied Physiology (1987).
2. Guyton.A.C, Textbook of medical physiology, 9th edition, Philadelphia, WB Saunders, 1991.
3. Guyton AC, Function of Human Body, 4th dition, Philadelphia, WB Saunders, 1985.
4. Wilson.K.J.W & Waugh.A, 1996, Ross & Wilson Anatomy & Physiology in Health & illness, 8th edition, Church hill living stone.
5. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
6. Nutrition - Concepts & Controversies, 8th Edition, by Sizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
7. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R. (1999): WesV Wadsworth, an International Thomson Publishing Co.
8. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
9. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkins.

11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Bimolecules – Introduction & Carbohydrates:

Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates: Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell's oxidative phosphorylation.

Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

UNIT –II

Chemistry of Biomolecules-,Proteins and Lipids

Proteins : Classification ,structure, and properties of proteins (Primary,Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine,Collagen), and globular proteins(Hemoglobin, Methhemoglobin)

Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids : Classification, structure and, properties of Lipids Overview of the Metabolism .

UNIT – III

Chemistry of Biomolecules-Enzymes and Vitamins

Enzymes: Enzymes as biological catalysts, IUB systems of classification, specific activity, Km & Vmax, evaluation. Line weaver Burk Plott. Effect of pH & temperature on enzyme catalyzed reactions, Enzyme inhibitors. Isoenzymes.

Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.

Vitamins –Water soluble and fat soluble vitamins ,physiological functions, factors influencing bioavailability of vitamins.

UNIT-IV

Chemistry of Biomolecules - DNA & RNA

DNA – double helical structure,Watson-Crick model of DNA and base-pairing

A,B and Z types of DNA

Nucleic acid-Denaturation and annealing of .DNA

RNA-A brief out line of structure and role of different types of RNA

11005P-PRACTICAL

Section-B

1. Acid & Alkalis: Preparation of Reagents and standard solutions-primary standards and secondary standards

2. Buffers: - Preparation of standard buffer solutions and determination of their pH

3. Estimation of glucose in blood.

4.Estimation of cholesterol in blood

5. Estimation of albumin in urine.
6. Estimation of creatinine in urine.
7. Fractionation of egg proteins and its quantification

Reference Books:

1. Stryer E.A. , Biochemistry, Moscow, Mir Publications, 1989.
2. Zubay, Geoffrey L., Biochemistry, 4th Ed, Dudagey, IAWCB Wm. C. Brown Publishers, 1988, London.
3. Murray Robert, Harper`s Biochemistry, 24th Ed, Prentice Hall International UK Ltd, 1990.
4. Greenberg David M., Metabolic Pathways, Vol 3, 3rd Ed, Academic Press Pvt Ltd, New York.
5. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
6. Swaminathan M., Essentials of Food and Nutrition, 2nd Ed, 1985, Ganesh and Co.
7. Gopalan C., et al, Dietary Allowances for Indians, NIH, Hyderabad.
8. Anita F.P., Clinical Dietetics and Nutrition, 4th Ed, 1997, Oxford Univ Press.
9. Lehninger Albert, 2001, Principles of Biochemistry, Kalyani Publishers, New Delhi.
10. Devlin, T.M., 1997, 4th Ed, Text Book of Biochemistry with Clinical Correlation, Wiley Liss Inc.
11. Voet and Voet, Fundamentals in Biochemistry.

11003 - NUTRACEUTICALS & FUNCTIONAL FOODS

(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II

Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III

Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV

Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

11006P – PRACTICAL

Section-A

1. Preparation of media and sterilization techniques :dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
2. Estimation of antioxidants A, C, E.,
3. Estimation of dietary fibers and fruit fibers.
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices& canned foods.

REFERENCE

1. Mary, K. Schmidl and Theodore, P. Labuza , Essentials of Functional Foods, Culinary and hospitality industry publication services, 2000.
2. Mazza, G , Functional Foods- Biochemical and processing aspects, Culinary and hospitality industry publication services, 1998.
3. Israel Goldberg , Functional foods, Pharma foods, Nutraceuticals, Culinary and hospitality industry publication services, 2001.
4. Robert easy Wildman , Handbook of Nutraceuticals and Functional Foods, Culinary and hospitality industry publication services, 2001.
5. David, H.Watson , Performance, Functional Foods, Culinary and hospitality industry publication services, 2003.
6. Chatwick, R et al. , Functional Foods, Springer, 2003.
7. Jeffery Horst, Methods of Analysis for Functional Foods and Nutraceuticals, CRS Press, 2002.
8. Paresh, C. Dutta , Phytosterols as Functional Food Components and Nutraceuticals,
9. Marcel Dehker Inc, New York, 2004.

(Prof. Dr. Sai Gopal)

UNIT I

Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II

Methods of isolation and detection of microorganism or their products in food.

- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III

Food Spoilage-General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.

Microbial spoilage: Chemical Changes caused by different Microorganisms –

Factors affecting the growth of Microorganisms and Hazards.

Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by

Micro organisms nature of food spoilage

Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: Food Borne Diseases:

Viral :- Hepatitis, Poliomyelitis,

Bacterial:- Botulism,, Salmonellosis, Gastroenteritis- Clostridium, vibrio cholera,, Enteropathogenic – Escherichia coli

Nonbacterial:- Mycotoxins, Aflatoxin, Patulin, Ochratoxin

Parasitic :- Tape worm, Ascaris

11006P – PRACTICALS

Section-B

1. Preparation of media-broth, solid media
2. Sterilization techniques: Dry and wet methods.
3. Identification of microorganisms by staining techniques- Simple, Gram & negative
4. Isolation of micro organisms

5. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

1. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York, 5th edition, 1993.
2. Atlas M.Ronals , Principles of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.
3. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.
4. Banwart , Basic food Microbiology, 2nd edition CBS Publisher, 1989. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.
5. Microbiology, by M. J. Pelczar, 4th edition, McGraw-Hill. Inc. N.Y. 1977.
6. General Microbiology, by R. Y. Steiner, 5th edition, Macmillan Education Ltd. London. 1987.

SEMESTER II

21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Food groups

Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II

Macro Nutrients –

Carbohydrates Classification, Functions, sources, effect of excess/low intake of

Carbohydrates

Proteins and Aminoacids, sources, effects of protein deficiency,

Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III

Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV

Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences

Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS

Section -A

1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A& B-Complex)and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro& micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.

REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
2. Swaminathan, M. Essentials of Food and Nutrition, Vol. I and Vol. II Ganesh & comp. Madras - 600 017 1974
3. Davidson and Panmore R., Brock, J.F., and Truswell A.S. Human Nutrition and Dietetics. 7th ed. New York. Churchill Living stone. 1979.
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
6. Jelliffe, D.B. Assessment of Nutritional Status of the Community, WHO Monograph. Series No. 53. WHO Geneva 1966.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)
8. Monograph on Integrated Training on National Programmes for Mother and Child Development of Women and Child Development Government of India, New Delhi.
9. Seymour L. Harpen M.D : Quick reference to liniccal nutrition 1979.
10. Sutor C.W Hunter M.F. Nutrition principles and Application in Health Promotion. J.B. Lippincot company Philadelphia 1980.

21002 - HUMAN NUTRITION

(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence

Physiology and endocrinology of lactation, Synthesis of milk components, effect of breast feeding on maternal health. Human milk composition and factors affecting breastfeeding and fertility. Dietary management in lactation.

Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development & dietary management in Childhood and Adolescence

UNIT – III

Adult and Geriatric (Ageing) Nutrition: Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes , nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet
2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet
3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES

1. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
2. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
3. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R... (1999): WesV Wadsworth, An International Thomson Publishing Co.
4. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
5. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkins.
6. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
7. Modern Nutrition in health and disease by Goodhearh R., S. Shills.
8. Nelson and Cox, 2000, Lehninger's Principles of Biochemistry, Worth Publishers.
9. Nutrition in Health and Disease 17th Edition; Anderson, Dibble, Turkki, Mitchell, Rynbergen J.B. Lippincott Company, 1982
10. Nutrition Principles and Application in Health Promotion Second Edition; C.J.W, Sutor, M.F. Crowley J.B. Lippincott Co., Philadelphia, 1984
11. Nutritional Evaluation of Food Processing Third Edition; E. Karmas and R.S. Harris AVI Boon, New York, 1988
12. Nutrition and Aging; M.L. Hutchinson, H.N. Munro Academic Press, Inc., 1986
13. Nutritional Quality Index of Foods; R.G. Hansen, B.W. Wyse, A.W. Sorenson AVI Publishing Co., Inc., 1979.

21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I

Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods

Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.

Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery

Pancreatic Disorders-.Pancreatitis,

UNIT II

Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:

Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,

Over view of liver Transplant, Pre and post liver transplant Dietary Management

Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD

Dialysis

Overview of Kidney Transplant and Dietary Management

UNIT III

Metabolic Disorders:-

i) Gout

ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria

iii) Etiopathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson's Disease and Multiple Sclerosis

Food born illnesses and Food allergy

Viral :- Hepatitis, Poliomyelitis,

Bacterial: Botulism,, Salmonellosis, Gastroenteritis-

Clostridium, vibriocholera,, Enteropathogenic – Escherichia coli

Nonbacterial:- Mycotoxins, Aflatoxin, Ochratoxin

UNIT IV

Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption &

Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

- 1.Planning and preparation of therapeutic modifications of normal diet.
- 2.Planning and preparation of diets for diabetis mellitus, liver disorders,gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

1. Antia FP, Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 4th edition, 1997.
2. Davidson, Pasmore P and Break LP, Human Nutrition and Dietetics, English language book society, Livingstone, 1986.
3. Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta, Bombay, 17th edition, 1990.
4. Garrow.JS & James W.P.T, Human Nutrition and Dieteics, Church Hill Living Stone, 1993.
5. Mahan.L.K and Stump SE, Krause's Food, Nutrition and Diet Therapy, WB Saunders Company, 10th edition, 2001.
6. The Management of Nutrition in Major Emergencies, A.I.T.D.S. Publishers and Distributors Delhi, First Edition 2002.
7. LoryA. Smolin and Mary B.Grosvenor, Nutrition Science and Application, Saunders College Publishing New York, Third Edition, 2000.
8. Mahtab S.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
9. Gopal, C. Kamalakrishnaswamy, Nutrition in Major Metabolic Disease, Oxford India Paper backs Publisher, First Edition, 2000.
10. Mahan, L.K., Stump, S.E and Krause, S, Food Nutrition & Diet therapy, 11th edition, W.B. saunders Co, 2004
11. Passmore, D.P and Break, J.P, Human Nutrition& Dietetics, English language Book Society, Livingston, 1986.
12. Shills, E.M and Olson, S.J and SMC, Modern nutrition in Health and Diseases, Volume II, 8th edition, Lea & Febringes, philadelphia1994.
13. Passmore, D.P and Break, J.P, Human Nutrition& Dietetics, English Language Book Society, Livingston, 1986.
14. Cataldo, C.B., Rolfes, S.R and whitney, E.N, Understanding clinical nutrition, west publishing Co. New york, 1991.
- 15.Joshi,Clinical nutrition

21004 - BIOSTATISTICS AND RESEARCH METHODOLOGY

(Prof. Dr. Raman, University of Madras)

UNIT I - Biostatistics

Biostatistics – Scope – Collection and classification of data - questionnaire, schedule, Tabulation and presentation of data – mean – median and mode- diagrammatic and graphic representation of data- standard deviation -standard error - coefficient of variation.

Random variable, types of Random variables , Covariance, Skewness and Kurtosis.

Normal distribution and its applications.

Concepts of Population,sample,parameter , statistic, sampling.

Concepts of correlation and regression analysys.

UNIT- II

Hypothesis- Statistical hypothesis, Null hypothesis, alternative hypothesis, critical region, level of significance, one and two tailed test.

Tests of significance based on large samples (Mean, SD,Proportion)

Small sample tests : t-test,F-test, Chi-square test- permutation and combination

ANOVA- A brief account of one Way Two way Analysis. Introduction to MANOVA- Introduction to Statistical Package for Social Sciences (SPSS) -use of statistical software such as COSTAT and STATISTICA.

UNIT III- Research methodology

Choosing the problem for research – stages in the execution of research -literature collection – Primary, secondary and tertiary sources – articles, reviews, abstract, current contents Bibliography – indexing and abstracting – Reporting the results of research in conferences – Oral and Poster presentation - Logical format for writing thesis and papers. Essential features of abstract, introduction, review of literature, materials and methods, and discussion.

UNIT IV-Research methodology

Effective illustration - tables and figures. Reference styles - Harvard and Vancouver systems - Research journals – impact factor - citation index- National and International –monographs – reprints – proof correction – Full paper – Short Communication – Review paper- books- Plagiarism. Introduction to intellectual property and intellectual property rights – types: patents, copy rights, trade marks, design rights, geographical indications. PCT. – legal protection of Nutraceutical product inventions – world intellectual property rights organization (WIPO)

21006 P -PRACTICAL:

Section-B

1. Problem solving using statistical software
2. Construct a research tool- Questionnaire and schedule

3. Prepare a research paper
4. Present abstract of a research report.
5. Preparation of diagrams/ graph

REFERENCES

1. Khan, I.A., and Khannum, A., (1994).Fundamentals of Biostatistics, Vikas Pub., Hyderabad
2. Kothari, C.R.,(1991).Research Methodology – Methods and Techniques, Wiley Eastern Ltd.,New Delhi
3. Handbook of Analytical Techniques Vol. I, Gunzler and Williams, Wiley-VCH, 2002.
4. Handbook of Analytical Techniques Vol. II, Gunzler and Williams, Wiley-VCH, 2002.
5. Instrumental analysis, Skoog, Holler, CrouchBrooks/Cole, 2007.
6. Bioanalysis Principles & Practices -Richard F Venn.
7. Chromatography: Liquid Chromatography, Mass Spectrometry, W M A Niesson, 2nd and 3rd Ed.
8. Chromatography: Gas Chromatography (Basic)-Harhold M Mcnair, James M Miller.
9. Chromatography: Gas Chromatography Modern Practice (4th Ed.)-Robert L Grab, Eugene F Barry.
10. Columns for Gas Chromatography -Barry & Grob
11. Capillary Electrophoresis Proteins-Tim Wehr/ Roberto Rodriguez- Diaz/ Mingde Zhu.
12. Capillary Electrophoresis of Nucleic Acids, Vol-1 & II –K. R. Mitchelson / jing Cheng
13. HPLC: Modern HPCL for Practicing Scientists-Michael W Dong
14. HPLC made to measures-Stavros Kromidas
15. HPLC: Practical HPLC-Veronika R Meyer
16. HPLC Quantitative Analysis of Pharmaceutical Formulations-Dr. P D Sethi
17. HPTLC(High Performance Thin Layer Chromatography)-Dr. P D Sethi
18. Herbal Medicines PDR 3rd ed. -Thomson
19. Herbal Medicine: Pharmacodynamic basis of Herbal Medicine 2nd ed-**Manuchair Ebadi**
20. HPLC: A Practical handbook of Preparative HPLC-Donald A Welling
21. HPLC for Pharmaceutical Scientists-Yuri Kazakevich
22. HPLC: A Practical user's Guide-Marvin C. McMaster
23. Mass Spectrometry (a Foundation Course)-K. Downard
24. Mass Spectrometry (Principle & Application)-E. Hoffmann & V. Stroobant
25. Solvent Extraction (Principles & Practices)-Jan Rydberg, Claude Musikas
26. Spectroscopy for the Biological Science.-HAMMES.

SEMESTER -III

31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I

Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

Nutrition Intervention Programmes- National and International Organizations - FAO, WHO, UNICEF, CARE, AFPRO, CWS, World Bank Integrated Child Development Services(ICDS) Programme, National prophylaxis programme for prevention of Blindness due to Vitamin-A deficiency, National Nutritional Anemia Control Programme, National Iodine deficiency Disorders Control Programme. Nutritional Surveillance, Role of Nutrition monitoring Bureau (NNMB).

UNIT III

Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

Food and Nutrition Security- Definition, Food Security determinations, Strategies to overcome Food insecurity. Role of Government and Non-governmental agencies in improving food security. Food security programmes, Food diversification, Food fortification.

31005P-PRACTICALS

Section -A

1. One week community nutrition camp & report
2. Planning, conducting and evaluating nutrition education programmes.
3. Assessment of nutritional status through anthropometry and dietary survey
4. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.

REFERENCES

1. Reddy.V; Rao.P.N; Sastry.G and Nath.K.K, Nutrition trends in India, NIN, Hyderabad.
2. Bamji, MS, Rao,MP; Reddy.V, “Textbook of human Nutrition”, Oxford and IBH Publishing Co, New Delhi.
3. Jeliffee.D.B, “Assessment of Nutritional Status of the community”, World Health Organisation, Geneva.
4. Swaminathan.M, “Principles of Nutrition and Dietetics”, Bangalore publishing company Ltd, Bangalore.
5. Park.K, “Park’s textbook of preventive and social medicine”, 16th edition, M/S ,BanarsidasBhanot publishers, Jabalpur.
6. WalRuchiMishra,S, Encyclopedia of Health Nutrition and family welfare, published by Sarup and sons, New Delhi 2000.
7. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.
8. Swaminathan, M.Handbook of Food and Nutrition, the Bangalore Printing and Publishing Co.Ltd, Fifth Edition, 2003.
9. Padmini Gupta, Ruchithakkar, Nutritional Disorders and Community Health, Pointer Ltd Publishers, Jaipur.
10. Venkataiah S.D. Nutrition Education, Anmol Publication Pvt, Ltd Reserved 2004.
11. MahtabS.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
12. Reddy, R.S. Nutrition Education, Common Wealth Publisher, First Edition, 2004.
13. R. C. Mishra , Health and Nutrition Education, A. P.H. Publishing Corporation, New Delhi, 2005.

31002 - FOOD PROCESSING AND SAFETY

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I

Food Processing- Principles and Methods of processing :

Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring. Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II

Meat and Flesh foods: Smoking, drying, canning.

Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III

Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.

Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV

Food Standards and laws

National food Laws, acts and implementing agencies FSSA, PFA, ISI, AGMARK, FPO etc.,

Role of Govt. in setting standards and quality control - Food quality control

Board, Technical Advisory committees, public health laboratories etc.,

International laws - ISO, CODEX.

31005P – PRACTICALS

Section - B

1. Visit to various food Industries.
2. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-

1. S.N. Mahindru, “ Food Safety- Concept and Reality”, APH Publishing corporation, 5 ansariroad, Daryaganj, New delhi-2004.
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing country perspective, Mac millan India Ltd, 2005
3. Vanisha Nambiar, A Text book on “Food contamination and Safety “ ANMOL Publications Pvt.Ltd, New Delhi-2004

4. Amerine, M.A., Pangborn RM, and Roessler BB Principles of Sensory, Evaluation of foods, Academic press New York, 1965.
5. The prevention of food adulteration Act, 1954 and Prevention of food adulteration Rules, 1955. (1998). Confederation of Indian Industry, New Delhi.
6. M. Swaminathan, Food Science & Experimental foods (1979) Ganesh & Company - Chennai.
7. Development in Milling and baking Technology (1991) Association of food scientists & Technologists, Mysore.
8. The prevention of food Adulteration Act 1954 (1997) Eastern Book Company, Lucknow.
9. Dr. Ramesh V. Bhat and R. Nageswar Rao (1992) Food Safety in Public catering. NIN, ICMR, Hyderabad.
10. F.C. Blank, Hand book of food & nutrition (1999). AGRO Botanical Publishers, India.
11. Norman N. Potter, Joseph H. Hotchkiss (1996) Food Science 5th Edition. CBS Publishers & Distributors, New Delhi.
12. Ramesh V. Bhat & B.S. Narasinga Rao, National Strategy for food quality control (1985), National Institute of Nutrition, ICMR, Hyderabad.
13. Perpinstrum - Anderson, World food trends and future food security (1994). Food Policy Report, The International Food Policy Research Institute, Washington, D.C.,

31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

1. Estimation of protein quality using any one method.
2. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
3. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
4. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES

1. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
2. Packaging technologies of functional foods *in* Functional food ingredients and Nutraceuticals processing technologies John Shi (Ed.) CRC Taylor & Francis group, 2007 for point 6.7.
3. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 21 page 495 for point 6.5.
4. Nutrition labeling handbook, Ralph Shapiro (Ed.), Marcel Dekker, N.Y., 1995 for point 6.8.
5. Dietary Supplements labeling-compliance review (third edition), James L. Summers (Ed.), Blackwell Publishing for point 6.8.
6. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 22 page 512 for point 6.6.
7. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapters 21, 22,23 & 24.
8. Biotechnology: Food Fermentation Vol I and II by Joshi and Pandey, 1999. Educational Publishers and Distributors, Kerala.
9. Food processing: Biotechnological Applications by Marvaha and Arora, 2000, Asiotech Publishers New Delhi.
10. Consumer's guide to Dietary supplements and alternative medicines servings of Hope, W. Marvin Davis, Pharmaceutical Products Press, 2006.

31004 – Instrumental Techniques

UNIT- I

Ultraviolet and Visible Spectroscopy: Various electronic transitions(185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

Infra red spectroscopy

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

Chromatography:

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

High performance liquid chromatography:

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

NMR Spectroscopy: Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations by NMR spectra.

Mass Spectrometry:

Principle, instrumentation, isotope abundance, metastable ions, fragmentation process, fragmentation associated with functional groups.

.UNIT-IV

Thermal Methods:

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{CaC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. Difference between TG and DTA.

31006 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Thermal analysis of coal or clay by Bomb Calorimeter

SEMESTER-IV

41001 – PROJECT WORK

It is proposed to include internship as a fieldwork for time duration of one month at near by hospitals as dietitian •

MODEL PAPERS-2015-2016

M.Sc.DEGREE EXAMINATIONS

11001

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – I-Basics of Human physiology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30

- | | |
|--------------------|-----------------------|
| 1. Cell theory | 5. Thyroid secretions |
| 2. Mitochondria. | 6. Menstrual cycle |
| 3. Blood functions | 7.MRI |
| 4. ECG | 8.Nephron |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40

9.a) Explain About digestive juices and their functions .

OR

b). Give a detailed account on cell organelle

10. a) Explain about gaseous exchange in lings and tissues.

OR

b)Describe about different types of circulation .

11. a) What are the Regulatory functions of endocrines .

OR

b) Describe about Male reproductive system.

.12 a) .Write in detail about structure of a nerve cell and its functions.

OR

b) . Describe about autonomous nervous system .

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

- | | |
|----------------------------------|------------------------|
| 1. Hendersen-Hasselbath equation | 5. Biological catalyts |
| 2. Redox potential | 6. Enzyme inhibitors |
| 3. Fibrous proteins | 7. DNA |
| 4. Deamination | 8 . RNA |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9. a) Write about classification of carbohydrates .

OR

b) Write about chemistry of glycolysis .

10. a) Give a details about classification and properties of Lipids

OR

b) Write about urea cycle and its regulations.

11. a) Explain about structure and functions of co enzymes

OR

b) Write about water soluble vitamins and their physiological functions

12. a) What is the Chemistry of DNA .

OR

b). Write about the chemistry in RNA

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III –Nutraceuticals and Functional foods

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|---------------------|-----------------------|
| 1. Functional foods | 5.Diabetes mellitus |
| 2. Flavonoids | 6.Vitamina A defiency |
| 3. Antioxidants. | 7.AIDS |
| 4.Probiotics | 8 .FUPA |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.)Describe about importance of Nutraceuticals

OR

b) .Explain about Primary and Secondary metabolites in plants

10. a) What are various properties and sources of non nutrient detoxifying agents .

OR

b)Explain about blocking and suppressing agents.

11. a) Role of nutraceuticals in obesity management .

OR

b) Write about PEM and role of nutraceuticals in its management

12. a) .Explain nutraceuticals of plant origin and their uses.

OR

b). Write about designer foods for degenerative diseases.

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER IV –FOOD MICROBIOLOGY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|-------------------------------|------------------------------|
| 1. Reduction potential | 5.Food spoilage |
| 2.Food borne infections | 6.Hepatitis |
| 3. Streaking technique | 7. Hazards of Microorganisms |
| 4.Detection of Microorganisms | 8.Poliomelitis |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.) Write about microorganisms which are important in food microbiology

(or)

(b) Explain about isolation and importance of micro organisms

10a).How the microorganisms are isolated from the food.

(or)

(b).Give a detailed account on molecular methods for identification of microorganisms in food

11.a). Describe about factors affecting microbial growth.

(or)

b). Give details about the Physical and chemical spoilage of food by insects and rodents.

12.a)Write about food borne diseases with bacteria .

(or)

b) Explain about food borne Vital diseases .

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – I-COMMUNITY NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

1. Discuss about Clinical examination in assessment of nutritional status .
2. Explain the classification used to categorize the mal nutrition .
3. Explain about FAO .
4. Write an detail about WHO.
5. Explain about training the change agents.
6. Give an account on principles of planning nutrition education programmed.
7. What is food fortification ? Explain .
8. Explain about food diversification

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). Classify direct and indirect methods of nutritional assessment and explain nutrition surveys in detail.

OR

B). Explain about classification used to categorize the malnutrition in children

10. a) Write in detail about CARE ..

OR

b) Explain in detail about ICDS .

11. a). Give an account training the change agents

OR

b) .Plan a nutrition education for community on malnourished children.

12. a) Elaborate on role of NGO agencies in improving food security .

OR

b). Explain in detail about food diversification and food fortification .

M.Sc .DEGREE EXAMINATIONS

31002

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –II –FOOD PROCEESING AND SAFETY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1.What is fermentation ? Explain .
- 2.Explain about germination
- 3.Smoking of flesh foods
4. Write about Blanching
5. Define food adulteration ?
6. Flavoring agents
7. AGMARK
8. ISO

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). How to process Rice ? Describe.

OR

B). Describe in detail about process of making cheese .

10. a) .Elaborate about processing of meat and flesh foods .

OR

b) .Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about commonly adulterer foods and their health hazards .

OR

b) Explain about sweeteners and preservatives.

12. a) Describe about food laws.

OR

b). Write in detail about role of government in setting standers and food quality control

Max.Marks: 70

TIME: 3hours

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1 Food product development
2. Explain Phases in food product development.
3. Write about nutraceuticals .
- 4 Define functional foods
5. Write optical properties of paper packaging in detail
6. Write about glass packaging material.
7. Dietary supplements.
8. Write in detail about food purchase habits of people

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). Elaborate about social and health concern on new product development.

OR

B). Explain in detail about screening of food product development.

10. a) .Discuss the supercritical food extraction technology in development of functional foods .

OR

b) . Write a brief note on new technologies in development of nutraceuticals development.

11. a) Describe the structure and properties of glass packaging material..

OR

b) Explain in detail about concept of aseptic packaging foods.

12. a) Write in detail about overview on labeling of dietary supplements . .

OR

b). Elaborate on role of government organisms agencies in improving food security

M.Sc .DEGREE EXAMINATIONS
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER –IV-INSTRUMENTAL TECHNIQUES

31004

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1a). CH₄ (b). CH₃CL
2. Give an account on
(A). Fermi resonance (B). Overtones
3. Discuss the principle of Thin layer Chromatography .
4. Define retention time and mention its importance in Chromatography .
5. Write is anisotropic effect .
6. Write a short note on (a). Met stable peak (B). Nitrogen rule .
7. Distinguish between TG AND DTA
8. Discuss the principle involved in DSC .

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Discuss the importance of HPLC in chemical analysis with suitable examples .

OR

- 10.a). Write a short note on (a). Paper Chromagrophy (B). Column Chromatography .

OR

11. a) Explain the following . (A). Vicinal coupling (B). Factors influencing chemical shift .

OR

12. a Give an account on

(A). Mc .Lafferty rearrangement (B). isotope labeling (C). Fast atom Bmbardment (FAB).

M.Sc.DEGREE EXAMINATIONS

21001

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –I-ESSENTIALS OF MACRO MICRO NUTRIENTS

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30

- | | |
|--------------------------------|--------------------------------|
| 1. Properties of food | 5. Thiamin |
| 2. Low intake of Carbohydrates | 6.Iron deficiency anemia |
| 3. Fat functions | 7. Brief explanation B12 |
| 4. Macro nutrients | 8. Iodine deficiency disorders |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40

9.a) Describe the Characteristic features and nutritive values of different foods .

OR

b). What are the main functions and classification of foods and nutrients .

10. a) Describe the levels of protein structure and effects of Protein deficiency .

OR

b).What are the Macro nutrients . Explain the carbohydrates functions sources and effects .

11. a). Illustrate the micronutrients and explain the requirements sources of vitamins .

OR

b) Classify the vitamins and its physiological functions and its deficiency .

12. a) . Describe the combat malnutrition with special reference to the major nutritional problem .

(OR)

b) What is the main sources of Vitamin A .

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. **6 x 5 = 30**

- 1.,Requirements of RDAS
2. Synthesis of Milk components .
3. Feeding infants
4. Ageing process
5. Importance of nutrients
6. Dietary management in lactation
- 7.Nutrition during floods
- 8.Weaning management

Section – II

Answer ALL questions. Each question carries 10 marks **4 x 10 = 40**

9.a). Give a detailed account on importance of nutrients during pregnancy

OR

B).Explain the importance of nutrients in growth development. .

10. a.). Explain the milk components and its effects and human milk composition.

OR

b).Discuss about dietary management in child hood.

11. a). Explain the Geriatrics nutrition and adult nutrition

b) Nutritional implications of ageing process .

12. a) . Explain in detail about sports nutrition .

(OR)

b). Nutrition during space travel .

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –III-CLINICAL AND THERAPEUTIC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|--|---------------------------|
| 1.,What is progressive diet .Explain . | 5. Effects of Drug dosage |
| 2. Metabolic aberrations | 6. ESRD |
| 3. Clinical aberrations | 7 .Liver cirrhosis |
| 4. Homocystinuria . | 8. Mycotoxins |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a). What are the Gastro intestinal disease .explain with examples .

OR

B). Explain progressive diet Diet general ,modified diets and nutritional support special feeding methods .

10. a.). Discuss about liver disorders .

OR

b).Describe about kidney transplant &dietary management

11. a). Explain metabolic & clinical aberrations , complications . prevention and dietary management of neurological disorders.

b). Explain bacterial disease with examples

12. a) . Describe the effect of drug dosage on food , nutrients .& Nutritional status .

(OR)

b).Effect of drug on digestion and absorption of nutrients .

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. **6 x 5 = 30**

- | | |
|---|--------------------------------|
| 1.,Student t test and Chi –square test | 5. Skewness of literature |
| 2.Choosing the problem for research problem | 6. Median |
| 3.ANOVA | 7. Impact factor |
| 4. Review of literature | 8. How to publish a full paper |

Section – II

Answer ALL questions. Each question carries 10 marks **4 x 10 = 40**

9.a Explain the statistical package for social sciences –use of statistical software such as COSTAT and STATISTICA

OR

B).What is Biostatistics ? How collection and classification of data ,tabulation and presentation of data .

10. a).Describe reporting results of research and oral and poster presentation in conferences –logical format for writing thesis and papers .

OR

b). Illustrate the logical format for writing thesis and papers .

11. a).Explain about the national and international ,proof correction and full paper –short communication –review paper –books –plagiarism

b).Writer about effective illustration –tables and figures . references styles –Harvard and Vancouver systems in a thesis

12. a) .Explain the intellectual property and intellectual property rights

(OR)

b).Describe the patenting ,procedures and applections for patent and granting of a patent and xcompulsary licenses .

SEMESTER-I

11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I

Cell Biology : Cell Structure, Cell theory, Cell cycle and functions of Cell membrane, Endoplasmic reticulum, Golgi apparatus, lysosomes, Mitochondria.

Digestive System: Composition & functions of salivary, gastric, intestinal & pancreatic secretions. Functions of bile salts, Mechanism of secretion of digestive juices and its regulation, movements of stomach, small intestine, villi, defecation. Liver – anatomy & physiology.

UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:

Blood; Introduction to hematology, functions of blood, functions of plasma proteins, erythrocytes and leucocytes, Hb, Important indices of RBC & WBC, Blood groups, ESR, blood viscosity, blood coagulation, Erythroblastosis foetalis, Blood transfusion.

Anatomical consideration of heart and CV system-special conducting tissues, properties of cardiac muscle, cardiac cycle, heart sounds, ECG & its interpretation, Heart rate & regulation. Cardiac output, hemorrhage. Compensatory changes after hemorrhage. Blood pressure, cardiovascular modifications during exercise. Different types of circulation- foetal circulation, pulmonary, hepatic, capillary. Techniques to identify cardiovascular disorders –angioplasty, angiogram.

UNIT III

Endocrine System: Endocrine secretions, glands, role and regulatory functions of endocrine, site of secretions, regulation of secretions. Mechanism of action of hormones.

Reproductive System: Male and female reproductive system-organs, structure and functions. Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization, conception, implantation. Male and female contraceptions - Etiology of male and female infertility.

UNIT IV Nervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR,Regulation of re-absorption.

11005P-PRACTICAL

Section-A

8. Demonstration of measuring BP using sphygmomanometer.
9. Determination/Identification of blood group and Rh factor.
10. Determination of TC of RBC & WBC

11. Determination of DC of WBC
12. Determination of ESR
13. Estimation of Hb by Sahlis Method.
14. Measurement of clotting time of blood

REFERENCES

10. Chatterjee.C.C, Human Physiology (11th edition), vol 1 & 2, Medical Allied Physiology (1987).
11. Guyton.A.C, Textbook of medical physiology, 9th edition, Philadelphia, WB Saunders, 1991.
12. Guyton AC, Function of Human Body, 4th dition, Philadelphia, WB Saunders, 1985.
13. Wilson.K.J.W & Waugh.A, 1996, Ross & Wilson Anatomy & Physiology in Health & illness, 8th edition, Church hill living stone.
14. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
15. Nutrition - Concepts & Controversies, 8th Edition, by Sizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
16. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R. (1999): WesV Wadsworth, an International Thomson Publishing Co.
17. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
18. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkin

11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Bimolecules – Introduction & Carbohydrates:

Acids, bases, salts, buffers, Henderson – Hasselbach equation.Theory indicators principles of measurement of pH.

Carbohydrates: Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell's oxidative phosphorylation.

Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

UNIT –II

Chemistry of Biomolecues-,Proteins and Lipids

Proteins : Classification ,structure, and properties of proteins (Primary,Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine,Collagen), and globular proteins(Hemoglobin, Methhemoglobin)

Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids : Classification, structure and, properties of Lipids Overview of the Metabolism .

UNIT – III

Chemistry of Biomolecules-Enzymes and Vitamins

Enzymes: Enzymes as biological catalysts, IUB systems of classification, specific activity, K_m & V_{max} , evaluation. Line weaver Burk Plott. Effect of pH & temperature on enzyme catalyzed reactions, Enzyme inhibitors. Isoenzymes.

Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.

Vitamins –Water soluble and fat soluble vitamins ,physiological functions, factors influencing bioavailability of vitamins.

UNIT-IV

Chemistry of Biomolecules - DNA & RNA

DNA – double helical structure, Watson-Crick model of DNA and base-pairing

A,B and Z types of DNA Nucleic acid-Denaturation and annealing of DNA

RNA-A brief outline of structure and role of different types of RNA

11005P-PRACTICAL

Section-B

- 1. Acid & Alkalis:** Preparation of Reagents and standard solutions-primary standards and secondary standards
- 2. Buffers: -** Preparation of standard buffer solutions and determination of their pH
3. Estimation of glucose in blood.
4. Estimation of cholesterol in blood
5. Estimation of albumin in urine.
6. Estimation of creatinine in urine.
7. fractionation of egg proteins and its quantification

Reference Books:

12. Stryer E.A. , Biochemistry, Moscow, Mir Publications, 1989.
13. Zubay, Geoffrey L., Biochemistry, 4th Ed, Dudagey, IAWCB Wm. C. Brown Publishers, 1988, London.
14. Murray Robert, Harper`s Biochemistry, 24th Ed, Prentice Hall International UK Ltd, 1990.
15. Greenberg David M., Metabolic Pathways, Vol 3, 3rd Ed, Academic Press Pvt Ltd, New York.
16. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.

17. Swaminathan M., Essentials of Food and Nutrition, 2nd Ed, 1985, Ganesh and Co.
18. Gopalan C., et al, Dietary Allowances for Indians, NIH, Hyderabad.
19. Anita F.P., Clinical Dietetics and Nutrition, 4th Ed, 1997, Oxford Univ Press.
20. Lehninger Albert, 2001, Principles of Biochemistry, Kalyani Publishers, New Delhi.
21. Devlin, T.M., 1997, 4th Ed, Text Book of Biochemistry with Clinical Correlation, Wiley Liss Inc.
22. Voet and Voet, Fundamentals in Biochemistry.

11003 - NUTRACEUTICALS & FUNCTIONAL FOODS

(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II

Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III

Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV

Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

1006P – PRACTICAL

Section-A

1. Preparation of media and sterilization techniques :dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
2. Estimation of antioxidants A, C, E.,
3. Estimation of dietary fibers and fruit fibers.
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices& canned foods.

REFERENCE

10. Mary, K. Schmidl and Theodore, P. Labuza , Essentials of Functional Foods, Culinary and hospitality industry publication services, 2000.
11. Mazza, G , Functional Foods- Biochemical and processing aspects, Culinary and hospitality industry publication services, 1998.
12. Israel Goldberg , Functional foods, Pharma foods, Nutraceuticals, Culinary and hospitality industry publication services, 2001.

13. Robert easy Wildman , Handbook of Nutraceuticals and Functional Foods, Culinary and hospitality industry publication services, 2001.
14. David, H.Watson , Performance, Functional Foods, Culinary and hospitality industry publication services, 2003.
15. Chatwick, R et al. , Functional Foods, Springer, 2003.
16. Jeffery Horst, Methods of Analysis for Functional Foods and Nutraceuticals, CRS Press, 2002.
17. Paresh, C. Dutta , Phytosterols as Functional Food Components and Nutraceuticals,
18. Marcel Dehker Inc, New York, 2004.

11004 - FOOD MICROBIOLOGY

(Prof. Dr. Sai Gopal)

UNIT I

Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II

Methods of isolation and detection of microorganism or their products in food.

- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III

Food Spoilage-General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.

Microbial spoilage: Chemical Changes caused by different Microorganisms –

Factors affecting the growth of Microorganisms and Hazards.

Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by

Micro organisms nature of food spoilage

Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: Food Borne Diseases:

Viral :- Hepatitis, Poliomyelitis,

Bacterial:- Botulism,, Salmonellosis, Gastroenteritis- Clostridium, vibrio cholera,, Enteropathogenic – Escherichia coli

Nonbacterial:- Mycotoxins, Aflatoxin, Patulin, Ochratoxin

Parasitic :- Tape worm, Ascaris

11006P – PRACTICALS

Section-B

6. Preparation of media-broth, solid media
7. Sterilization techniques: Dry and wet methods.
8. Identification of microorganisms by staining techniques- Simple, Gram & negative
9. Isolation of micro organisms
10. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

7. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York, 5th edition, 1993.
8. Atlas M.Ronals , Principles of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.
9. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.
10. Banwart , Basic food Microbiology, 2nd edition CBS Publisher, 1989. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.
11. Microbiology, by M. J. Pelczar, 4th edition, McGraw-Hill. Inc. N.Y. 1977.
12. General Microbiology, by R. Y. Steiner, 5th edition, Macmillan Education Ltd. London. 1987.

SEMESTER II

21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Food groups

Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II

Macro Nutrients –

Carbohydrates Classification, Functions, sources, effect of excess/low intake of

Carbohydrates

Proteins and Aminoacids, sources, effects of protein deficiency,

Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III

Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV

Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences

Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS

Section -A

1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A& B-Complex)and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro& micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.

REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
2. Swaminathan, M. Essentials of Food and Nutrition, Vol. I and Vol. II Ganesh & comp. Madras - 600 017 1974
3. Davidson and Panmore R., Brock, J.F., and Truswell A.S. Human Nutrition and Dietetics. 7th ed. New York. Churchill Living stone. 1979.
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
6. Jelliffe, D.B. Assessment of Nutritional Status of the Community, WHO Monograph. Series No. 53. WHO Geneva 1966.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)
8. Monograph on Integrated Training on National Programmes for Mother and Child Development of Women and Child Development Government of India, New Delhi.
9. Seymour L. Harpen M.D : Quick reference to liniccal nutrition 1979.
10. Sutor C.W Hunter M.F. Nutrition principles and Application in Health Promotion. J.B. Lippincot company Philadelphia 1980.

21002 - HUMAN NUTRITION

(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence

Physiology and endocrinology of lactation, Synthesis of milk components, effect of breast feeding on maternal health. Human milk composition and factors affecting breastfeeding and fertility. Dietary management in lactation.

Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development & dietary management in Childhood and Adolescence

UNIT – III

Adult and Geriatric (Ageing) Nutrition: Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes , nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet
2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet
3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES

14. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
15. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
16. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R... (1999): WesV Wadsworth, An International Thomson Publishing Co.
17. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
18. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkins.
19. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
20. Modern Nutrition in health and disease by Goodhearth R., S. Shills.
21. Nelson and Cox, 2000, Lehninger's Principles of Biochemistry, Worth Publishers.
22. Nutrition in Health and Disease 17th Edition; Anderson, Dibble, Turkki, Mitchell, Rynbergen J.B. Lippincott Company, 1982
23. Nutrition Principles and Application in Health Promotion Second Edition; C.J.W, Sutor, M.F. Crowley J.B. Lippincott Co., Philadelphia, 1984

24. Nutritional Evaluation of Food Processing Third Edition; E. Karmas and R.S. Harris AVI Boon, New York, 1988
25. Nutrition and Aging; M.L. Hutchinson, H.N. Munro Academic Press, Inc., 1986
26. Nutritional Quality Index of Foods; R.G. Hansen, B.W. Wyse, A.W. Sorenson AVI Publishing Co., Inc., 1979.

21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I

Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods

Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.

Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery

Pancreatic Disorders-.Pancreatitis,

UNIT II

Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:

Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,

Over view of liver Transplant, Pre and post liver transplant Dietary Management

Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD

Dialysis

Overview of Kidney Transplant and Dietary Management

UNIT III

Metabolic Disorders:-

i) Gout

ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria

iii) Etiopathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson 's Disease and Multiple Sclerosis

Food born illnesses and Food allergy

Viral :- Hepatitis,Poliomyelitis,

Bacterial:Botulism,,Salmonellosis,Gastroenteritis-

Clostridium,vibriocholera,,Enteropathogenic –Eschertia coli

Nonbacterial:-Mycotoxins,Aflotoxin, Ochratoxin

UNIT IV

Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption & Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

- 1.Planning and preparation of therapeutic modifications of normal diet.
- 2.Planning and preparation of diets for diabetis mellitus, liver disorders,gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

15. Antia FP, Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 4th edition, 1997.
16. Davidson, Pasmore P and Break LP, Human Nutrition and Dietetics, English language book society, Livingstone, 1986.
17. Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta, Bombay, 17th edition, 1990.
18. Garrow.JS & James W.P.T, Human Nutrition and Dieteics, Church Hill Living Stone, 1993.
19. Mahan.L.K and Stump SE, Krause's Food, Nutrition and Diet Therapy, WB Saunders Company, 10th edition, 2001.
20. The Management of Nutrition in Major Emergencies, A.I.T.D.S. Publishers and Distributors Delhi, First Edition 2002.
21. LoryA. Smolin and Mary B.Grosvenor, Nutrition Science and Application, Saunders College Publishing New York, Third Edition, 2000.
22. Mahtab S.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
23. Gopal, C. Kamalakrishnaswamy, Nutrition in Major Metabolic Disease, Oxford India Paper backs Publisher, First Edition, 2000.
24. Mahan, L.K., Stump, S.E and Krause, S, Food Nutrition & Diet therapy, 11th edition, W.B. saunders Co, 2004
25. Passmore, D.P and Break, J.P, Human Nutrition& Dietetics, English language Book Society, Livingston, 1986.
26. Shills, E.M and Olson, S.J and SMC, Modern nutrition in Health and Diseases, Volume II, 8th edition, Lea & Febringes, philadelphia1994.
27. Passmore, D.P and Break, J.P, Human Nutrition& Dietetics, English Language Book Society, Livingston, 1986.
28. Cataldo, C.B., Rolfes, S.R and whitney, E.N, Understanding clinical nutrition, west publishing Co. New york, 1991.

15.Joshi,Clinical nutrition

21004 - BIOSTATISTICS AND RESEARCH METHODOLOGY

(Prof. Dr. Raman, University of Madras)

UNIT I - Biostatistics

Biostatistics – Scope – Collection and classification of data - questionnaire, schedule, Tabulation and presentation of data – mean – median and mode- diagrammatic and graphic representation of data- standard deviation -standard error - coefficient of variation.

Random variable, types of Random variables , Covariance, Skewness and Kurtosis.

Normal distribution and its applications.

Concepts of Population,sample,parameter , statistic, sampling.

Concepts of correlation and regression analysys.

UNIT- II

Hypothesis- Statistical hypothesis, Null hypothesis, alternative hypothesis, critical region, level of significance, one and two tailed test.

Tests of significance based on large samples (Mean, SD,Proportion)

Small sample tests : t-test,F-test, Chi-square test- permutation and combination

ANOVA- A brief account of one Way Two way Analysis. Introduction to MANOVA- Introduction to Statistical Package for Social Sciences (SPSS) -use of statistical software such as COSTAT and STATISTICA.

UNIT III- Research methodology

Choosing the problem for research – stages in the execution of research -literature collection – Primary, secondary and tertiary sources – articles, reviews, abstract, current contents Bibliography – indexing and abstracting – Reporting the results of research in conferences – Oral and Poster presentation - Logical format for writing thesis and papers. Essential features of abstract, introduction, review of literature, materials and methods, and discussion.

UNIT IV-Research methodology

Effective illustration - tables and figures. Reference styles - Harvard and Vancouver systems - Research journals – impact factor - citation index- National and International –monographs – reprints – proof correction – Full paper – Short Communication – Review paper- books- Plagiarism. Introduction to intellectual property and intellectual property rights – types: patents, copy rights, trade marks, design rights, geographical indications. PCT. – legal protection of Nutraceutical product inventions – world intellectual property rights organization (WIPO)

21006 P -PRACTICAL:

Section-B

1. Problem solving using statistical software
2. Construct a research tool- Questionnaire and schedule
3. Prepare a research paper
4. Present abstract of a research report.
5. Preparation of diagrams/ graph

REFERENCES

3. Khan, I.A., and Khannum, A., (1994).Fundamentals of Biostatistics, Vikas Pub., Hyderabad
4. Kothari, C.R.,(1991).Research Methodology – Methods and Techniques, Wiley Eastern Ltd.,New Delhi
3. Handbook of Analytical Techniques Vol. I, Gunzler and Williams, Wiley-VCH, 2002.
4. Handbook of Analytical Techniques Vol. II, Gunzler and Williams, Wiley-VCH, 2002.
27. Instrumental analysis, Skoog, Holler, CrouchBrooks/Cole, 2007.
28. Bioanalysis Principles & Practices -Richard F Venn.
29. Chromatography: Liquid Chromatography, Mass Spectrometry, W M A Niesson, 2nd and 3rd Ed.
30. Chromatography: Gas Chromatography (Basic)-Harhold M Mcnair, James M Miller.
31. Chromatography: Gas Chromatography Modern Practice (4th Ed.)-Robert L Grab, Eugene F Barry.
32. Columns for Gas Chromatography -Barry & Grob
33. Capillary Electrophoresis Proteins-Tim Wehr/ Roberto Rodriguez- Diaz/ Mingde Zhu.
34. Capillary Electrophoresis of Nucleic Acids, Vol-1 & II –K. R. Mitchelson / jing Cheng
35. HPLC: Modern HPCL for Practicing Scientists-Michael W Dong
36. HPLC made to measures-Stavros Kromidas
37. HPLC: Practical HPLC-Veronika R Meyer
38. HPLC Quantitative Analysis of Pharmaceutical Formulations-Dr. P D Sethi
39. HPTLC(High Performance Thin Layer Chromatography)-Dr. P D Sethi
40. Herbal Medicines PDR 3rd ed. -Thomson
41. Herbal Medicine: Pharmacodynamic basis of Herbal Medicine 2nd ed-**Manuchair Ebadi**
42. HPLC: A Practical handbook of Preparative HPLC-Donald A Welling
43. HPLC for Pharmaceutical Scientists-Yuri Kazakevich
44. HPLC: A Practical user's Guide-Marvin C. McMaster
45. Mass Spectrometry (a Foundation Course)-K. Downard
46. Mass Spectrometry (Principle & Application)-E. Hoffmann & V. Stroobant
47. Solvent Extraction (Principles & Practices)-Jan Rydberg, Claude Musikas
48. Spectroscopy for the Biological Science.-HAMMES.

SEMESTER III

31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I

Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

Nutrition Intervention Programmes- National and International Organizations - FAO, WHO, UNICEF, CARE, AFPRO, CWS, World Bank Integrated Child Development Services(ICDS) Programme, National prophylaxis programme for prevention of Blindness due to Vitamin-A deficiency, National Nutritional Anemia Control Programme, National Iodine deficiency Disorders Control Programme. Nutritional Surveillance, Role of Nutrition monitoring Bureau (NNMB).

UNIT III

Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

Food and Nutrition Security- Definition, Food Security determinations, Strategies to overcome Food insecurity. Role of Government and Non-governmental agencies in improving food security. Food security programmes, Food diversification, Food fortification.

31005P-PRACTICALS

Section -A

5. One week community nutrition camp & report
6. Planning, conducting and evaluating nutrition education programmes.
7. Assessment of nutritional status through anthropometry and dietary survey
8. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.

REFERENCES

14. Reddy.V; Rao.P.N; Sastry.G and Nath.K.K, Nutrition trends in India, NIN, Hydrabad.
15. Bamji, MS, Rao,MP; Reddy.V, “Textbook of human Nutrition”, Oxford and IBH Publishing Co, New Delhi.
16. Jeliffee.D.B, “Assessment of Nutritional Status of the community”, World Health Organisation, Geneva.
17. Swaminathan.M, “Principles of Nutrition and Dietetics”, Bangalore publishing company Ltd, Bangalore.
18. Park.K, “Park’s textbook of preventive and social medicine”, 16th edition, M/S ,BanarsidasBhanot publishers, Jabalpur.
19. WalRuchiMishra,S, Encyclopedia of Health Nutrition and family welfare, published by Sarup and sons, New Delhi 2000.
20. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.
21. Swaminathan, M.Handbook of Food and Nutrition, the Banglore Printing and Publishing Co.Ltd, Fifth Edition, 2003.
22. Padmini Gupta, Ruchithakkar, Nutritional Disorders and Community Health, Pointer Ltd Publishers, Jaipur.
23. Venkataiah S.D. Nutrition Education, Anmol Publication Pvt, Ltd Reserved 2004.
24. MahtabS.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
25. Reddy, R.S. Nutrition Education, Common Wealth Publisher, First Edition, 2004.
26. R. C. Mishra , Health and Nutrition Education, A. P.H. Publishing Corporation, New Delhi, 2005.

31002 - FOOD PROCESSING AND SAFETY

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I

Food Processing- Principles and Methods of processing :

Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.

Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II

Meat and Flesh foods: Smoking, drying, canning.

Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III

Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.

Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV

Food Standards and laws

National food Laws, acts and implementing agencies FSSAI, PFA, ISI, AGMARK, FPO etc.,

Role of Govt. in setting standards and quality control - Food quality control

Board, Technical Advisory committees, public health laboratories etc.,

International laws - ISO, CODEX.

31005P – PRACTICALS

Section - B

3. Visit to various food Industries.
4. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-

1. S.N. Mahindru, " Food Safety- Concept and Reality", APH Publishing corporation, 5 ansariroad, Daryaganj, New delhi-2004.
2. Rajesh Mehta and J. George-" Food Safety Regulations concerns and Trade- The developing countryerspective, Mac millan India Ltd, 2005
3. Vanisha Nambiar, A Text book on "Food contamination and Safety " ANMOL Publications Pvt.Ltd, New Delhi-2004
4. Amerine, M.A., Pangborn RM, and Roessler BB Principles of Senssy, Evaluation of foods, Academic press New York, 1965.
5. The prevention of food adulteratin Act, 1954 and Prevention of food adulteration Rules, 1955. (1998). Confederration of Indian Industry, New Delhi.
6. M. Swaminathan, Food Science & Eperimental foods (1979) Ganesh & Company - Chennai.
7. Development in Milling and baking Technology (1991) Association of food scientists & Technologists, Mysore.
8. The prevention of food Adulteration Act 1954 (1997) Eastern Book Company, Lucknow.
9. Dr. Ramesh V. Bhat and R. Nageswar Rao (1992) Food Safety in Public catering. NIN, ICMR, Hyderaba.
10. F.C. Blank, Hand book of food & nutition (1999). AGRO Botanical Publishers, India.
11. Norman N. Potter, Joseph H. Hotchkiss (1996) Food Science 5th Edition. CBS Publishers & Distibutors, New Delhi.
12. Ramesh V. Bhat & B.S. Narasinga Rao, National Strategy forr food quality control (1985), National Institute of Nutrition, ICMR, Hyderabad.
13. Perpinstrum - Anderson, World food trends and futurre food security (1994). Food Policy Report, The International Food Policy Research Institute, Washington, D.C.,

31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

7. Estimation of protein quality using any one method.
8. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
9. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
10. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES

11. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
12. Packaging technologies of functional foods *in* Functional food ingredients and Nutraceuticals processing technologies John Shi (Ed.) CRC Taylor & Francis group, 2007 for point 6.7.
13. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 21 page 495 for point 6.5.
14. Nutrition labeling handbook, Ralph Shapiro (Ed.), Marcel Dekker, N.Y., 1995 for point 6.8.
15. Dietary Supplements labeling-compliance review (third edition), James L. Summers (Ed.), Blackwell Publishing for point 6.8.
16. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 22 page 512 for point 6.6.
17. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapters 21, 22,23 & 24.
18. Biotechnology: Food Fermentation Vol I and II by Joshi and Pandey, 1999. Educational Publishers and Distributors, Kerala.
19. Food processing: Biotechnological Applications by Marvaha and Arora, 2000, Asiatech Publishers New Delhi.
20. Consumer's guide to Dietary supplements and alternative medicines servings of Hope, W. Marvin Davis, Pharmaceutical Products Press, 2006.

31004 – Instrumental Techniques

UNIT- I

Ultraviolet and Visible Spectroscopy: Various electronic transitions(185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

Infra red spectroscopy

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

Chromatography:

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

High performance liquid chromatography:

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

NMR Spectroscopy: Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations of simple molecules by NMR spectra. structural interpretation of simple molecules by NMR spectra.

Mass Spectrometry:

Principle, instrumentation, isotope abundance, met stable ions, Mc lafferty rearrangement ,nitrogen rule ,fragmentation associated with functional groups; Carbonyl compounds ,alcohols ,amines, olefins, α , β -Unsaturated systems

.UNIT-IV

Thermal Methods:

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{CaC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. Difference between TG and DTA.

31006 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Separation of the compounds by Thin layer Chromatography, Paper Chromatography
5. Thermal analysis of coal or clay by Bomb Calorimeter

SEMESTER-IV

41001 – PROJECT WORK

PROJECT:

The thesis work shall be written & submitted in four copies. Only such candidates shall be permitted to offer Dissertation (if provided in the scheme of the examination) in lieu of the paper as have secured at least 55% or more marks in the aggregate of all the papers prescribed for the previous examination.

In 41001 Project Work –Scheme of Evaluation of the project Work for 600 Marks is specified as given below—

For internal assessment by the internal guide (on the basis of the report given by External guide considering attendance, regularity, interest and performance of the student.) -----
----- 200 M

For Project dissertation submission ----- 200M

(Average is to be taken from External and Internal Examiners Marks)

For project presentation and Viva-voce -----200M

MODEL PAPERS-2016-2017

M.Sc.DEGREE EXAMINATIONS

11001

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – I-Basics of Human physiology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. $6 \times 5 = 30$

1. Functions of cell
2. Golgi apparatus
3. Erythroblast sis foetalis
4. Angiogram
5. Pituitary hormones
6. Menstrual cycle
7. EEG
8. Renal reabsorption

Section – II

Answer ALL questions. Each question carries 10 marks $4 \times 10 = 40$

9. a) Write about composition and functions of gastric ,intestinal and pancreatic secretions

OR

b). Give a detailed account on cell organelle

10. a) Write about cardiac cycle with all events .

OR

b) Describe about different types of circulation .

11. a) What are the Regulatory functions of endocrines .

OR

b) Describe about Female reproductive system.

.12 a) Give a detailed structure about kidney including its functions

OR

b) . Describe about autonomous nervous system .

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

- | | |
|---------------------------------|-------------------------------|
| 1. Respiratory chain | 5. Biological catalysts |
| 2. principles measurement of ph | 6. Enzyme inhibitors |
| 3. Deamination | 7. Globular proteins |
| 4. Structure of proteins | 8 . Oxidative phosphorylation |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9. a) Write about classification of carbohydrates .

OR

b) Give a detailed account on lipid metabolism

10. a) Give a details about classification and properties of proteins

OR

b) Give a detailed account on lipid metabolism

11. a).How the vitamins are classified and write about any two fat soluble vitamintes

OR

b) Give an account on water soluble vitamins

12. a) Explain about structure and role of different types of RNA

OR

b). Give a detailed description about A,B and Z TYPES OF DNA

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III –Nutraceuticals and Functional foods

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|-------------------|-------------------------|
| 1. Nutraceuticals | 5.PEM |
| 2. Flavonoids | 6.CVD |
| 3.Caritenoids | 7 . Parkin sons disease |
| 4.Phytochemicals | 8 .FUPA |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.)Write about importance of Functional foods

OR

b) Explain about cereal technology

10. a) Give information about structure and properties of antioxidants

OR

b)Explain about blocking and suppressing agents.

11. a) Role of nutraceuticals in obesity management .

OR

b) Explain about effects of nutraceuticals in neurological disorders .

12. a) .Explain nutraceuticals of plant origin and their uses.

OR

b). Write about designer foods for diabetes .

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER IV –FOOD MICROBIOLOGY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|---------------------------------|------------------------------|
| 1. Moisture oxidation | 5.Food contamination |
| 2.Useful microorganisms | 6.Hepatitis |
| 3. Isolation of micro organisms | 7. Hazards of Microorganisms |
| 4.Detection of Microorganisms | 8.Gastroentertis |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

- 9.a.) Write about microorganisms which are important in food microbiology
(or)
(b) Give a detailed account on growth and reproduction of micro organisms
- 10a).How the microorganisms are isolated from the food.
(or)
(b).Give a detailed account on molecular methods for identification of microorganisms in food
- 11.a). What are various immunological methods for finding microorganisms in food
(or)
b). Explain in detailed about microbial spoilage of food
- 12.a)Write about food borne Parasitic diseases (or)
b) Write about food borne diseases of non bacterial ori

M.Sc.DEGREE EXAMINATIONS

31001

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – I-COMMUNITY NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1.write short notes on food frequency questionnaire
- 2.elaborate on family diet surveys
- 3 describe national nutrition anemia program me
- 4.Write an detail about WHO.
- 5.write about guidelines for training nutrition education
- 6.How do you evaluate the nutrition education program me
7. write about strategies to overcome food security
8. Explain about food diversification

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a).Elaborate on clinical assessment for various nutritional disorders

OR

B).write in detail about age and cause specific mortality and morbidity

10. a).Write in detail about Vitamin A Prophylaxis program me

OR

b) Explain in detail about national nutritional anemia control program me . .

11. a). Write in detail about planning ,executing and evaluating nutrition education .

OR

b) .Plan a nutrition education for community on malnourished children.

12. a) Write in detail about food security programmes

OR

b).Elaborate on rol of Government organisms agencies in improving food security

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|---------------------------------|------------------------------|
| 1. Write about homogenation | 5. Explain about emulsifiers |
| 2. Explain about Pasteurization | 6. Flavoring agents |
| 3. Fleshfoods | 7. AGMARK |
| 4. Write about Blanching | 8. CODEX |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). Explain in detail about flour milling of cereals

OR

B). Discuss about processing of milk .

10. a) .Elaborate about processing of meat and flesh foods .

OR

b) .Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about Food additives .

OR

b) Explain in detail about food adulteration

12. a). Describe about technical advisory committee in food quality control

OR

b). Elaborate in detail about international laws

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

1. Write about charcteration factors ion shaping new product development
2. Describe consumer trails and test market
3. Write about supercritical food extraction technology .
- 4 Explain bioprocessing technology for production of nutraceuticals
5. Write optical properties of paper packaging indetail
6. Writeabout glass packaging material.
7. Dietary supplements.
8. What ar the basics of oral communication used to convey the message written

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

- 9.a). Elaborate about social and health concern on new product development.

OR

B). Explain in detail about screening of food product development.

10. a) .Write in detail about application of bio process technology for production of nutraceuticals .

OR

b) . Write a brief note on new technologies in development of nutraceuticals development.

11. a) Describe the structure and properties of glass packaging material..

OR

b) Explain in detail about concept of aseptic packaging foods.

12. a). Describe regulatory agencies views on label claims

OR

- b). Elaborate on role of government organisms agencies in improving food security

M.Sc .DEGREE EXAMINATIONS

31004

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –IV-INSTRUMENTAL TECHNIQUES

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1a). Explain the following (A). Bath chromic shift B). Hyper chromic effect
2. How can you distinguish the ketenes ,aldehydes ,esters , amides and acids by IR Spectroscopy .
3. Discuss the principles and application of paper chromatography
4. Define retention time and mention its importance in Chromatography .
5. Discuss the types of ionization in mass spectrometry . .
6. What is nuclear overhaused effect / Explain with an examples .
7. Discuss the basic principle involved in DTA
8. Give an account on factors affecting thermal data

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Explain the following (A). Steric effect in biphenyls (B). Factors influencing vibration frequencies

OR

- 10.). Write a short note on (a). Paper Chromagrophy (B). Column Chromatography .

OR

11. Explain the principle involved in HPLC and how this technique is superior than gas chromatography .

OR

12. Discussion the following (a). Contact shift reagents (B). Karpluscurve variation of coupling constant

13. Explain the factors affecting fragmentation in Mass spectrometry .

14. Discuss the instrumentation of DTA and how this technique is useful in chemical analysis

M.Sc.DEGREE EXAMINATIONS

21001A

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –I-ESSENTIALS OF MACRO MICRO NUTRIENTS

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|---------------------------|--------------------------------|
| 1. Properties of food | 5. Thiamin |
| 2. Milk and milk products | 6. Vitamin E |
| 3. Fatty acids | 7. PERNICIOUS ANEMIA |
| 4. Carbohydrates | 8. Iodine deficiency disorders |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Write about properties and nutritive values of fruits and vegetables

OR

b). Describe the characteristics and nutritive value of millets and pulses

10. a) Explain about carbohydrates sources, functions and effects of carbohydrates deficiency.

OR

b)..Write an account on functions and effects poly unsaturated fatty acids

11. a). Describe the biochemical functions, sources and dietary requirements of zinc

OR

b) Explain the dietary requirements, biochemical functions and sources of vitamin D

12. a). Describe Iron deficiency anemia (IDA). Causes and consequences.

(OR)

b) What are the main sources of Vitamin A.

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. $6 \times 5 = 30$

1. Role of Hormones during pregnancy
2. Importance of nutrients in growth
3. Factors affecting breastfeeding
4. Feeding of infants
5. Nutritional requirement during ageing
6. Nutrient requirement for adult women with heavy work
7. BMR
8. Space nutrition

Section – II

Answer ALL questions. Each question carries 10 marks $4 \times 10 = 40$

9.a). Give a detailed account on importance of nutrients during pregnancy

OR

B). Explain the importance of Breast feeding . .

10. a). Explain about growth development during infancy

OR

b). Write about factors affecting Breast feeding and fertility

11. a). Give a detailed account on nutrition an related to moderate life style

b) Nutritional implications of ageing process .

12. a) . Explain in detail about nutrition at high altitudes

(OR)

b). Give a detailed account on nutrition during special needs like famines

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –III-CLINICAL AND THERAPEUTIC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|--------------------------|----------------------------------|
| 1,.Modified diets | 5. GOUT |
| 2.Ulcertative colitis | 6. Multiple sclerosis |
| 3. Chronic renal failure | 7 .Drug dosage |
| 4. Glomerularenthritiis | 8. Nutrient and drug interaction |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a). Discuss about Diarrhea and dysentery in detail including signs , symptoms and diet control

OR

B). Give a detailed account on pancreatic disorders .

10. a.). Discuss about liver disorders.

OR

b).Describe about kidney transplant &dietary management

11. a). Explain food born bacterial infections in detail .

b). Describe about inborn errors metabolism

12. a) .Discuss about effect of drugs on metabolism of nutrients .

(OR)

b).Describe the effect of drug dosage on nutritional status

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –IV –Biostatistics and Research methodology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30

- | | |
|---------------------------|--------------------------|
| 1.Questionnaire | 5. Literature collection |
| 2.Mean , median and mode | 6. Writing papers |
| 3. Alternative hypothesis | 7. Impact factor |
| 4. T-.TEST | 8.Citation index |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40

9.). Describe the scope of biostatistics collection and classification of data .

OR

B).Explain random variable .

10. a.) Write about the Chi –square test

OR

b). Give a brief account of one way and Two way analysis

11. a).Explain the choosing the problem for research

b). Write short notes on (A) Logical format for writing (B). Essential features of abstract

12. a) .Write about reference styles

(OR)

b).What is trade mark ? Explain the various types of trade mark in India

2017-2018

REVISED SYLLABUS

SEMESTER-I

11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I

Cell Biology : Cell Structure, Cell theory, Cell cycle and functions of Cell membrane, Endoplasmic reticulum, Golgi apparatus, lysosomes, Mitochondria.

Digestive System: Composition & functions of salivary, gastric, intestinal & pancreatic secretions. Functions of bile salts, Mechanism of secretion of digestive juices and its regulation, movements of stomach, small intestine, villi, defecation. Liver – anatomy & physiology.

UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:

Blood; Introduction to hematology, functions of blood, functions of plasma proteins, erythrocytes and leucocytes, Hb, Important indices of RBC & WBC, Blood groups, ESR, blood viscosity, blood coagulation, Erythroblastosis foetalis, Blood transfusion.

Anatomical consideration of heart and CV system-special conducting tissues, properties of cardiac muscle, cardiac cycle, heart sounds, ECG & its interpretation, Heart rate & regulation. Cardiac output, hemorrhage. Compensatory changes after hemorrhage. Blood pressure, cardiovascular modifications during exercise. Different types of circulation- foetal circulation, pulmonary, hepatic, capillary. Techniques to identify cardiovascular disorders –angioplasty, angiogram.

UNIT III

Endocrine System: Endocrine secretions, glands, role and regulatory functions of endocrine, site of secretions, regulation of secretions. Mechanism of action of hormones.

Reproductive System: Male and female reproductive system-organs, structure and functions. Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization, conception, implantation. Male and female contraceptions - Etiology of male and female infertility.

UNIT IV Nervous System: Structure of a nerve cell-reflex action, nervous transmission-cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR,Regulation of re-absorption.

11005P-PRACTICAL

Section-A

15. Demonstration of measuring BP using sphygmomanometer.
16. Determination/Identification of blood group and Rh factor.
17. Determination of TC of RBC & WBC
18. Determination of DC of WBC
19. Determination of ESR
20. Estimation of Hb by Sahlis Method.
21. Measurement of clotting time of blood

REFERENCES

19. Chatterjee.C.C, Human Physiology (11th edition), vol 1 & 2, Medical Allied Physiology (1987).
20. Guyton.A.C, Textbook of medical physiology, 9th edition, Philadelphia, WB Saunders, 1991.
21. Guyton AC, Function of Human Body, 4th dition, Philadelphia, WB Saunders, 1985.
22. Wilson.K.J.W & Waugh.A, 1996, Ross & Wilson Anatomy & Physiology in Health & illness, 8th edition, Church hill living stone.
23. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
24. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
25. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R. (1999): WesV Wadsworth, an International Thomson Publishing Co.
26. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
27. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkin

11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Biomolecules – Introduction & Carbohydrates:

Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates: Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell's oxidative phosphorylation.

Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

UNIT –II

Chemistry of Biomolecules-,Proteins and Lipids

Proteins : Classification ,structure, and properties of proteins (Primary,Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine,Collagen), and globular proteins(Hemoglobin, Methhemoglobin)

Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids : Classification, structure and, properties of Lipids Overview of the Metabolism .

UNIT – III

Chemistry of Biomolecules-Enzymes and Vitamins

Enzymes: Enzymes as biological catalysts, IUB systems of classification, specific activity, Km & Vmax, evaluation. Line weaver Burk Plott. Effect of pH & temperature on enzyme catalyzed reactions, Enzyme inhibitors. Isoenzymes.

Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.

Vitamins –Water soluble and fat soluble vitamins ,physiological functions, factors influencing bioavailability of vitamins.

UNIT-IV

Chemistry of Biomolecules - DNA & RNA

DNA – double helical structure,Watson-Crick model of DNA and base-pairing

A,B and Z types of DNANucleic acid-Denaturation and annealing of .DNA

RNA-A brief out line of structure and role of different types of RNA

11005P-PRACTICAL

Section-B

1. **Acid & Alkalis:** Preparation of Reagents and standard solutions-primary standards and secondary standards
2. **Buffers:** - Preparation of standard buffer solutions and determination of their pH
3. Estimation of glucose in blood.
4. Estimation of cholesterol in blood
5. Estimation of albumin in urine.
6. Estimation of creatinine in urine.
7. fractionation of egg proteins and its quantification

Reference Books:

23. Stryer E.A. , Biochemistry, Moscow, Mir Publications, 1989.
24. Zubay, Geoffrey L., Biochemistry, 4th Ed, Dudagey, IAWCB Wm. C. Brown Publishers, 1988, London.
25. Murray Robert, Harper`s Biochemistry, 24th Ed, Prentice Hall International UK Ltd, 1990.
26. Greenberg David M., Metabolic Pathways, Vol 3, 3rd Ed, Academic Press Pvt Ltd, New York.
27. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
28. SwaminathanM.,Essentials of Food and Nutrition, 2nd Ed, 1985, Ganesh and Co.
29. Gopalan C., et al, Dietary Allowances for Indians, NIH, Hyderabad.
30. Anita F.P., Clinical Dietetics and Nutrition, 4th Ed, 1997, Oxford Univ Press.
31. Lehninger Albert, 2001, Principles of Biochemistry, Kalyani Publishers, New Delhi.
32. Devlin, T.M., 1997, 4th Ed, Text Book of Biochemistry with Clinical Correlation, Wiley Liss Inc.
33. Voet and Voet, Fundamentals in Biochemistry.

11003 - NUTRACEUTICALS & FUNCTIONAL FOODS

(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II

Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III

Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV

Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

11006P – PRACTICAL

Section-A

1. Preparation of media and sterilization techniques :dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
2. Estimation of antioxidants A, C, E.,
3. Estimation of dietary fibers and fruit fibers.
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices& canned foods.

REFERENCE

19. Mary, K. Schmidl and Theodore, P. Labuza , Essentials of Functional Foods, Culinary and hospitality industry publication services, 2000.
20. Mazza, G , Functional Foods- Biochemical and processing aspects, Culinary and hospitality industry publication services, 1998.
21. Israel Goldberg , Functional foods, Pharma foods, Nutraceuticals, Culinary and hospitality industry publication services, 2001.
22. Robert easy Wildman , Handbook of Nutraceuticals and Functional Foods, Culinary and hospitality industry publication services, 2001.
23. David, H.Watson , Performance, Functional Foods, Culinary and hospitality industry publication services, 2003.
24. Chatwick, R et al. , Functional Foods, Springer, 2003.
25. Jeffery Horst, Methods of Analysis for Functional Foods and Nutraceuticals, CRS Press, 2002.
26. Paresh, C. Dutta , Phytosterols as Functional Food Components and Nutraceuticals,
27. Marcel Dehker Inc, New York, 2004.

11004 - FOOD MICROBIOLOGY

(Prof. Dr. Sai Gopal)

UNIT I

Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II

Methods of isolation and detection of microorganism or their products in food.

- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III

Food Spoilage-General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.

Microbial spoilage: Chemical Changes caused by different Microorganisms –

Factors affecting the growth of Microorganisms and Hazards.

Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by

Micro organisms nature of food spoilage

Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: Food Borne Diseases:

Viral :- Hepatitis, Poliomyelitis,

Bacterial:- Botulism,, Salmonellosis, Gastroenteritis- Clostridium, vibrio cholera,, Enteropathogenic – Escherichia coli

Nonbacterial:- Mycotoxins, Aflatoxin, Patulin, Ochratoxin

Parasitic : - Tape worm, Ascaris

11006P – PRACTICALS

Section-B

11. Preparation of media-broth, solid media
12. Sterilization techniques: Dry and wet methods.
13. Identification of microorganisms by staining techniques- Simple, Gram & negative
14. Isolation of micro organisms
15. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

13. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York, 5th edition, 1993.
14. Atlas M.Ronals , Principles of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.
15. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.
16. Banwart , Basic food Microbiology, 2nd edition CBS Publisher, 1989. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.
17. Microbiology, by M. J. Pelczar, 4th edition, McGraw-Hill. Inc. N.Y. 1977.
18. General Microbiology, by R. Y. Steiner, 5th edition, Macmillan Education Ltd. London. 1987.

SEMESTER II

21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Food groups

Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II

Macro Nutrients –

Carbohydrates Classification, Functions, sources, effect of excess/low intake of

Carbohydrates

Proteins and Aminoacids, sources, effects of protein deficiency,

Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III

Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV

Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences

Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS

Section -A

1. Assesment of dietary intakes of Macro Nutrients in different age groups.
2. Assesment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A& B-Complex)and Minerals- (Iron and Calcium)
- 3.Preparation of foods rich in macro& micronutrients.
- 4.Formulation of nutrients,supplementary foods for infants,children,aged and persons suffering from specific nutritional deficiencies and convalescing subjects.

REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
2. Swaminathan, M. Essentials of Food and Nutrition, Vol. I and Vol. II Ganesh & comp. Madras - 600 017 1974
3. Davidson and Panmore R., Brock, J.F., and Truswell A.S. Human Nutrition and Dietetics. 7th ed. New York. Churchill Living stone. 1979.
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
6. Jelliffe, D.B. Assessment of Nutritional Status of the Community, WHO Monograph. Series No. 53. WHO Geneva 1966.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)
8. Monograph on Integrated Training on National Programmes for Mother and Child Development of Women and Child Development Government of India, New Delhi.
9. Seymour L. Harpen M.D : Quick reference to clinical nutrition 1979.
10. Sutor C.W Hunter M.F. Nutrition principles and Application in Health Promotion. J.B. Lippincot company Philadelphia 1980.

21002 - HUMAN NUTRITION

(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence

Physiology and endocrinology of lactation, Synthesis of milk components, effect of breast feeding on maternal health. Human milk composition and factors affecting breastfeeding and fertility. Dietary management in lactation.

Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development & dietary management in Childhood and Adolescence

UNIT – III

Adult and Geriatric (Ageing) Nutrition: Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes , nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet
2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet
3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES

27. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
28. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
29. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R... (1999): WesV Wadsworth, An International Thomson Publishing Co.
30. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
31. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkins.
32. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
33. Modern Nutrition in health and disease by Goodhearth R., S. Shills.
34. Nelson and Cox, 2000, Lehninger's Principles of Biochemistry, Worth Publishers.
35. Nutrition in Health and Disease 17th Edition; Anderson, Dibble, Turkki, Mitchell, Rynbergen J.B. Lippincott Company, 1982
36. Nutrition Principles and Application in Health Promotion Second Edition; C.J.W, Sutor, M.F. Crowley J.B. Lippincott Co., Philadelphia, 1984
37. Nutritional Evaluation of Food Processing Third Edition; E. Karmas and R.S. Harris AVI Boon, New York, 1988
38. Nutrition and Aging; M.L. Hutchinson, H.N. Munro Academic Press, Inc., 1986
39. Nutritional Quality Index of Foods; R.G. Hansen, B.W. Wyse, A.W. Sorenson AVI Publishing Co., Inc., 1979.

21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I

Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods

Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.

Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery

Pancreatic Disorders- Pancreatitis,

UNIT II

Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:

Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,

Over view of liver Transplant, Pre and post liver transplant Dietary Management

Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD

Dialysis

Overview of Kidney Transplant and Dietary Management

UNIT III

Metabolic Disorders:-

i) Gout

ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria

iii) Etiopathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson's Disease and Multiple Sclerosis

Food born illnesses and Food allergy

Viral :- Hepatitis, Poliomyelitis,

Bacterial: Botulism, Salmonellosis, Gastroenteritis-

Clostridium, vibrio cholera, Enteropathogenic – Escherichia coli

Nonbacterial:- Mycotoxins, Aflatoxin, Ochratoxin

UNIT IV

Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption &

Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

- 1.Planning and preparation of therapeutic modifications of normal diet.
- 2.Planning and preparation of diets for diabetes mellitus, liver disorders,gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

29. Antia FP, Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 4th edition, 1997.
 30. Davidson, Pasmore P and Break LP, Human Nutrition and Dietetics, English language book society, Livingstone, 1986.
- Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta,

SEMESTER II

21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Food groups

Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II

Macro Nutrients –

Carbohydrates Classification, Functions, sources, effect of excess/low intake of

Carbohydrates

Proteins and Aminoacids, sources, effects of protein deficiency,

Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III

Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV

Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences

Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS

Section -A

1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A& B-Complex)and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro& micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.

REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
2. Swaminathan, M. Essentials of Food and Nutrition, Vol. I and Vol. II Ganesh & comp. Madras - 600 017 1974
3. Davidson and Panmore R., Brock, J.F., and Truswell A.S. Human Nutrition and Dietetics. 7th ed. New York. Churchill Living stone. 1979.
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
6. Jelliffe, D.B. Assessment of Nutritional Status of the Community, WHO Monograph. Series No. 53. WHO Geneva 1966.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)
8. Monograph on Integrated Training on National Programmes for Mother and Child Development of Women and Child Development Government of India, New Delhi.
9. Seymour L. Harpen M.D : Quick reference to liniccal nutrition 1979.
10. Sutor C.W Hunter M.F. Nutrition principles and Application in Health Promotion. J.B. Lippincot company Philadelphia 1980.

21002 - HUMAN NUTRITION

(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence

Physiology and endocrinology of lactation, Synthesis of milk components, effect of breast feeding on maternal health. Human milk composition and factors affecting breastfeeding and fertility. Dietary management in lactation.

Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development & dietary management in Childhood and Adolescence

UNIT – III

Adult and Geriatric (Ageing) Nutrition: Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes , nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet
2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet
3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES

40. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
41. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
42. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R... (1999): WesV Wadsworth, An International Thomson Publishing Co.
43. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
44. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkins.
45. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
46. Modern Nutrition in health and disease by Goodhearth R., S. Shills.
47. Nelson and Cox, 2000, Lehninger's Principles of Biochemistry, Worth Publishers.
48. Nutrition in Health and Disease 17th Edition; Anderson, Dibble, Turkki, Mitchell, Rynbergen J.B. Lippincott Company, 1982
49. Nutrition Principles and Application in Health Promotion Second Edition; C.J.W, Sutor, M.F. Crowley J.B. Lippincott Co., Philadelphia, 1984

50. Nutritional Evaluation of Food Processing Third Edition; E. Karmas and R.S. Harris AVI Boon, New York, 1988
51. Nutrition and Aging; M.L. Hutchinson, H.N. Munro Academic Press, Inc., 1986
52. Nutritional Quality Index of Foods; R.G. Hansen, B.W. Wyse, A.W. Sorenson AVI Publishing Co., Inc., 1979.

21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I

Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods

Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.

Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery

Pancreatic Disorders-.Pancreatitis,

UNIT II

Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:

Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,

Over view of liver Transplant, Pre and post liver transplant Dietary Management

Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD

Dialysis

Overview of Kidney Transplant and Dietary Management

UNIT III

Metabolic Disorders:-

i) Gout

ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria

iii) Etiopathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson 's Disease and Multiple Sclerosis

Food born illnesses and Food allergy

Viral :- Hepatitis,Poliomyelitis,

Bacterial:Botulism,,Salmonellosis,Gastroenteritis-

Clostridium,vibriocholera,,Enteropathogenic –Eschertia coli

Nonbacterial:-Mycotoxins,Aflotoxin, Ochratoxin

UNIT IV

Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption & Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

- 1.Planning and preparation of therapeutic modifications of normal diet.
- 2.Planning and preparation of diets for diabetis mellitus, liver disorders,gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

31. Antia FP, Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 4th edition, 1997.
32. Davidson, Pasmore P and Break LP, Human Nutrition and Dietetics, English language book society, Livingstone, 1986.
33. Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta, Bomba

SEMESTER III

31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I

Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

Nutrition Intervention Programmes- National and International Organizations - FAO, WHO, UNICEF, CARE, AFPRO, CWS, World Bank Integrated Child Development Services(ICDS) Programme, National prophylaxis programme for prevention of Blindness due to Vitamin-A deficiency, National Nutritional Anemia Control Programme, National Iodine deficiency Disorders Control Programme. Nutritional Surveillance, Role of Nutrition monitoring Bureau (NNMB).

UNIT III

Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

Food and Nutrition Security- Definition, Food Security determinations, Strategies to overcome Food insecurity. Role of Government and Non-governmental agencies in improving food security. Food security programmes, Food diversification, Food fortification.

31005P-PRACTICALS

Section -A

9. One week community nutrition camp & report
10. Planning, conducting and evaluating nutrition education programmes.
11. Assessment of nutritional status through anthropometry and dietary survey
12. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.

REFERENCES

27. Reddy.V; Rao.P.N; Sastry.G and Nath.K.K, Nutrition trends in India, NIN, Hyderabad.
28. Bamji, MS, Rao,MP; Reddy.V, “Textbook of human Nutrition”, Oxford and IBH Publishing Co, New Delhi.
29. Jeliffee.D.B, “Assessment of Nutritional Status of the community”, World Health Organisation, Geneva.
30. Swaminathan.M, “Principles of Nutrition and Dietetics”, Bangalore publishing company Ltd, Bangalore.
31. Park.K, “Park’s textbook of preventive and social medicine”, 16th edition, M/S ,BanarsidasBhanot publishers, Jabalpur.
32. WalRuchiMishra,S, Encyclopedia of Health Nutrition and family welfare, published by Sarup and sons, New Delhi 2000.
33. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.
34. Swaminathan, M.Handbook of Food and Nutrition, the Bangalore Printing and Publishing Co.Ltd, Fifth Edition, 2003.
35. Padmini Gupta, Ruchithakkar, Nutritional Disorders and Community Health, Pointer Ltd Publishers, Jaipur.

36. Venkataiah S.D. Nutrition Education, Anmol Publication Pvt, Ltd Reserved 2004.
37. MahtabS.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
38. Reddy, R.S. Nutrition Education, Common Wealth Publisher, First Edition, 2004.
39. R. C. Mishra , Health and Nutrition Education, A. P.H. Publishing Corporation, New Delhi, 2005.

31002 - FOOD PROCESSING AND SAFETY

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I

Food Processing- Principles and Methods of processing :

Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.

Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II

Meat and Flesh foods: Smoking, drying, canning.

Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III

Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.

Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV

Food Standards and laws

National food Laws, acts and implementing agencies FSSA, PFA,ISI, AGMARK, FPO etc.,

Role of Govt.in setting standards and quality control - Food quality control

Board, Technical Advisory committees, public health laboratories etc.,

International laws - ISO, CODEX.

31005P – PRACTICALS

Section - B

5. Visit to various food Industries.
6. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-

1. S.N. Mahindru, “ Food Safety- Concept and Reality”, APH Publishing corporation, 5 ansariroad, Daryaganj, New delhi-2004.
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing countryerspective, Mac millan India Ltd, 2005
3. Vanisha Nambiar, A Text book on “Food contamination and Safety “ ANMOL Publications Pvt.Ltd, New Delhi-2004
4. Amerine, M.A., Pangborn RM, and Roessler BB Principles of Senssy, Evaluation of foods, Academic press New York, 1965.
5. The prevention of food adulteratin Act, 1954 and Prevention of food adulteration Rules, 1955. (1998). Confederration of Indian Industry, New Delhi.
6. M. Swaminathan, Food Science & Epermental foods (1979) Ganesh & Company - Chennai.
7. Development in Milling and baking Technology (1991) Association of food scientists & Technologists, Mysore.
8. The prevention of food Adulteration Act 1954 (1997) Eastern Book Company, Lucknow.
9. Dr. Ramesh V. Bhat and R. Nageswar Rao (1992) Food Safety in Public catering. NIN, ICMR, Hyderaba.
10. F.C. Blank, Hand book of food & nutition (1999). AGRO Botanical Publishers, India.
11. Norman N. Potter, Joseph H. Hotchkiss (1996) Food Science 5th Edition. CBS Publishers & Distibutors, New Delhi.
12. Ramesh V. Bhat & B.S. Narasinga Rao, National Strategy forr food quality control (1985), National Institute of Nutrition, ICMR, Hyderabad.
13. Perpinstrum - Anderson, World food trends and futurre food security (1994). Food Policy Report, The International Food Policy Research Institute, Washington, D.C

31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

11. Estimation of protein quality using any one method.
12. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
13. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
14. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES

21. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
22. Packaging technologies of functional foods *in* Functional food ingredients and Nutraceuticals processing technologies John Shi (Ed.) CRC Taylor & Francis group, 2007 for point 6.7.
23. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 21 page 495 for point 6.5.
24. Nutrition labeling handbook, Ralph Shapiro (Ed.), Marcel Dekker, N.Y., 1995 for point 6.8.

25. Dietary Supplements labeling-compliance review (third edition), James L. Summers (Ed.), Blackwell Publishing for point 6.8.
26. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 22 page 512 for point 6.6.
27. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapters 21, 22,23 & 24.
28. Biotechnology: Food Fermentation Vol I and II by Joshi and Pandey, 1999. Educational Publishers and Distributors, Kerala.
29. Food processing: Biotechnological Applications by Marvaha and Arora, 2000, Asiatech Publishers New Delhi.
30. Consumer's guide to Dietary supplements and alternative medicines servings of Hope, W. Marvin Davis, Pharmaceutical Products Press, 2006.

31004 – Instrumental Techniques

UNIT- I

Ultraviolet and Visible Spectroscopy: Various electronic transitions(185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

Infra red spectroscopy

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

Chromatography:

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

High performance liquid chromatography:

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

NMR Spectroscopy: Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations by NMR spectra.

Mass Spectrometry:

Principle, instrumentation, isotope abundance, metastable ions, fragmentation process, fragmentation associated with functional groups.

.UNIT-IV

Thermal Methods:

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{CaC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. Difference between TG and DTA.

31006 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Thermal analysis of coal or clay by Bomb Calorimeter

SEMESTER-IV

41001 – PROJECT WORK

PROJECT:

The thesis work shall be written & submitted in four copies. Only such candidates shall be permitted to offer Dissertation (if provided in the scheme of the examination) in lieu of the paper as have secured at least 55% or more marks in the aggregate of all the papers prescribed for the previous examination.

In 41001 Project Work –Scheme of Evaluation of the project Work for 600 Marks is specified as given below—

For internal assessment by the internal guide (on the basis of the report given by External guide considering attendance, regularity, interest and performance of the student.) -----

200 M

For Project dissertation submission ----- 200M

(Average is to be taken from External and Internal Examiners Marks)

For project presentation and Viva-voce -----200M

MODEL PAPERS-2017-2018

M.Sc.DEGREE EXAMINATIONS

11001

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – I-Basics of Human physiology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Functions of cell Membrane
2. Bile and its salt
3. Respiratory organs
4. Functions of blood
5. Role of Thyroid secretions in Carbohydrate metabolism
6. What is Menstrual cycle
7. Describe about MRI and its interpretations
8. Structure of Nephron

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.Explain about structure as well as functions of cell

OR

b). Give a detailed account on Liver anatomy and physiology

10. a) Write about respiratory system and control of respiration

OR

b)Discus in detail about cardiac cycle and its events

11. a) What are the Regulatory functions of endocrines .

OR

b) Explain about structure and functions of male reproductive organs

.12 a) Write in detail about structure and functions of nerve cell

OR

b) Discus about renal reabsorption and its regulation

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – II-NUTRITIONAL BIOCHEMISTRY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

- | | |
|---|---|
| 1. Buffers | 5.IUB classification of enzymes |
| 2.What are the principles measurement of ph | 6. Structure and functions of co enzyme A |
| 3. Properties of proteins | 7. Watson –crick model of DNA |
| 4. Globular proteins | 8 .Structure of RNA |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9. a) Write In detail about respiratory chain

OR

b) Describe about EMP pathway

10. a) Discuss about deamination

OR

b) Explain about overview metabolism of lipids

11. a).Give an account factors affecting enzyme activity and inhibition .

OR

b) Give an account on water soluble vitamins

12. a). Describe about the DNA structure and chemistry

OR

b). Write in detail about role of different types of RNA

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III –Nutraceuticals and Functional foods

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|------------------------------------|-----------------------|
| 1. Functional foods | 5.PEM |
| 2. Carotenoids | 6.Diabetes mellitus |
| 3. Blocking and suppressing agents | 7 . Parkinson disease |
| 4. Vitamin A Deficiency | 8 .Designer foods |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.) Define functional foods ? Explain the functional food technology of nutraceuticals

OR

b) Explain the following (A). Omega three fatty acids (B). Sulfur contain amino acids

10. a) Write in detail about structure ,properties and non nutrients detoxifying agents

OR

b). Give a detailed account on bioactive phytochemicals .

11. a) Role of nutraceuticals in disease management with examples ,.

OR

b) Explain about effects of nutraceuticals in neurological disorders .

12. a) .. (A) Designer foods (B). Cardiovascular diseases

OR

b). Write about types and uses of nutraceuticals/

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER IV –FOOD MICROBIOLOGY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|-----------------------------|--------------------|
| 1. Classify Micro organisms | 5. Food spoilage |
| 2. Nutrient content | 6.Enzymes in foods |
| 3. Convetional methds | 7. Botulism |
| 4.Immunilological methods | 8.Mycotoxins |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.) Write about food as a substrate for microorganisms .

(or)

(b) Explain about morphology growth and reproduction of microorganisms

10a).Discuss in detail about about chemical methods .

(or)

(b).Give a detailed about molecular methods

11.a). Give about chemical changes caused by different micro organisms

(or)

b). Explain in detailed about microbial spoilage of food

12.a)Discussthe food borne bacterial disease

(or)

b) Write in detail about food borne parasitic disease

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – I-COMMUNITY NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- 1.write about Biochemical methods of assessment
2. Give about age specific mortality and morbidity
- 3 describe national nutrition aneamia program me
- 4.Write an detail about WHO.
- 5.write about guidelines for training nutrition education
- 6.How do you evaluate the nutrition education program me
7. what is food fortification ? explain .
8. Write about strategies toover come food insecurity

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). Describe about direct methods of nutritional assessment

OR

B). Explain about classification used to categorize th malnutrition in children .

10. a).Write in detail about Vitamin A Prophylaxis program me

OR

b) Explain in detail about national nutritional anemia control program me . .

11. a).Give an account training the change agents .

OR

b) .Plan a nutrition education for community on malnourished children.

12. Describe the role non governmental agencies in improving food security .

OR

b). Write in detail about food diversification .

M.Sc .DEGREE EXAMINATIONS

31002

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –II –FOOD PROCEESING AND SAFETY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =

30M

- 1.What are the principles of food processing
- 2.Explain about germination
- 3.Fleshfoods
4. Write about Blanching
5. How the adulteration for fats and oils is carried out .
6. Write about stabilizers and emulsifiers
- 7.FSSA
8. Public health laberties

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). How to process rice ? Describe

OR

B). Explain in detail about pasteurization and methods pasteurization

10. a) .Discuss about processing of meat

OR

b) .Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about Food adulteration ? Discuss about simple identification tests of food adulteration

OR

b) Explain about preservatives in detail.

12. a). Describe about national laws

OR

b).Discuss about public health laboratories .

M.Sc .DEGREE EXAMINATIONS

31003

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –III-Development and Marketing of Nutraceuticals and functional foods

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Write the classification of product development with examples .
2. Explain about external sources of idea generation
3. Write about sources and role of nutraceuticals with examples
- 4 Explain bioprocessing technology for production of nutraceuticals
5. Write optical properties of paper packaging in detail
6. Write about glass packaging material.
7. Dietary supplements.
8. Briefly write about food purchase habits of customers

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a). Enumerate the different phases of food product development .

OR

B). Explain in detail about screening of new product development.

10. a) .Write in detail about application of bio process technology for production of nutraceuticals

.OR

b) . Discuss the application of bioprocess technology for the production of nutraceuticals . .

11. a) Define food packaging ? Explain its role in food preservation

OR

b) Explain in detail (A). Aseptic packaging (B). Glass packaging

12. a). Give an overview on issues of dietary supplements labeling

OR

b). Write aboutFDA requirements and regulatory agencies views on labeling of dietary supplements .

M.Sc .DEGREE EXAMINATIONS

31004

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –IV-INSTRUMENTAL TECHNIQUES

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =

30M

- 1 Write a note on effect of solvents on electronic transitions
2. Discuss the instrumentation of FT-IR
3. Describe different types of HPLC detections
4. Write briefly on Chromatographic behavior of solutes and column process
5. Explain the factors influencing the coupling constant
6. Discuss (A) Isotopic abundance (B). Met stable ions' .
7. Discuss the basic principle involved in DTA
8. Discuss the factors affecting TG

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Write fisher wood ward rules for conjugated dienes

OR

B). I. Define 2. Auxochrome 3. Chromophores

- 10.). A). Explain column chromatography and its applications

OR

11.A). Explain the principle involved in HPLC and how this technique is superior than gas chromatography .

OR

B). Write the principle and applications of differential scanning calorimetric

12a). Describe the principles and instrumentation of differential scanning

B). Write the difference between TG and DTA

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – I-ESSENTIALS OF MACRO AND MICRO NUTRIENTS

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|---|--------------------------|
| 1. Properties of food | 5. Vitamin-E |
| 2. Essential fatty acids | 6.Functions of nutrients |
| 3. Effect of excess intake of Carbohydrates | 7.Iron deficiency Anemia |
| 4. Riboflavin | 8.Goiter |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Describe the characteristics features and Nutritive values of different foods?

OR

b) Explain the Nutritive importance of Cereals, grains, Pulses and nuts?

10. a) Explain about Carbohydrate, sources, functions and effects of Carbohydrate deficiency?

OR

b) Write an account on the Effects of protein and amino acid Deficiency disorders?

11. a) Discuss the biochemical function, dietary requirements, sources of Calcium and phosphorous?

OR

b) explain the dietary requirement, biochemical functions and sources of Vitamin-D?

OR

12. a) .Describe Iodine Deficiency Disorders (IDD) causes and Consequences ?

OR

b) Explain the prevalence and Control strategies of Vitamin-A Deficiency?

TIME: 3hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =30M.

1. Requirements of RDA
2. Importance of nutrients in growth and development
3. Synthesis of milk components
4. Weaning management
5. Dietary management in lactation
6. Ageing process
7. Space nutrition
8. Brief explanation on nutritional during special need

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9 a) Give a detailed account on importance of nutrients during pregnancy.

OR

b). Write in detailed about importance of breast feeding.

10). a). Explain the growth and development and dietary management in childhood and Adolescence

OR

b) Write down the physiology of lactation and the factors influencing the lactation

11. a) Explain the Geriatrics Nutrition and adult Nutrition.

OR

b) Explain about the process of ageing and nutrition in same process.

12. a) Explain about the sport nutrition.

OR

b). Give a detailed account on nutrition during special needs like floods and famines.

b).Describe the effect of drug dosage on nutritional status

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – III-CLINICAL AND THERAPETUC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M.

- | | |
|---|-------------------|
| 1. Differences between Normal and Progressive diet. | 5. Fructosuria |
| 2. Ulcerative colitis. | 6.ESRD |
| 3. Hepatic coma. | 7.Liver cirrhosis |
| 4.clinical aberrations | 8.Botulism |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a) what are the Gastro –intestinal disease .Explain with examples .

OR

b) . Explain Progressive Diet –general ,Modified diets and Nutritional support special feeding methods

10). a). Describe about Liver disorders .

OR

b) . Describe about Kidney transplant & dietary management .

11. a) .Explain Metabolic & clinical aberrations ,complications . prevention and dietary management of Neurological disorders

OR

b) .Explain bacterial diseases with examples .

OR

12. a) .Describe the effect of drug dosage on food ,nutrients & nutritional status .

OR

b). Explain the effect of drugs of ingestion ,digestion ,,absorption &metabolism of nutrients .

21004 - BIOSTATISTICS AND RESEARCH MET

M.Sc.DEGREE EXAMINATIONS

21004A

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –IV –Biostatistics and Research methodology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|---------------------------|--------------------------|
| 1. Questionnaire | 5. Literature collection |
| 2. Mean , median and mode | 6. Writing papers |
| 3. Alternative hypothesis | 7. Impact factor |
| 4. T-.TEST | 8. Citation index |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.). Describe the scope of biostatistics collection and classification of data .

OR

B). Explain random variable .

10. a.) Write about the Chi –square test

OR

b). Give a brief account of one way and Two way analysis

11. a). Explain the choosing the problem for research

b). Write short notes on (A) Logical format for writing (B). Essential features of abstract

12. a) . Write about reference styles

(OR)

b). What is trade mark ? Explain the various types of trade mark in India

2018-2019

SEMESTER-I

11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I

Cell Biology : Cell Structure, Cell theory, Cell cycle and functions of Cell membrane, Endoplasmic reticulum, Golgi apparatus, lysosomes, Mitochondria.

Digestive System: Composition & functions of salivary, gastric, intestinal & pancreatic secretions. Functions of bile salts, Mechanism of secretion of digestive juices and its regulation, movements of stomach, small intestine, villi, defecation. Liver – anatomy & physiology.

UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:

Blood; Introduction to hematology, functions of blood, functions of plasma proteins, erythrocytes and leucocytes, Hb, Important indices of RBC & WBC, Blood groups, ESR, blood viscosity, blood coagulation, Erythroblastosis foetalis, Blood transfusion.

Anatomical consideration of heart and CV system-special conducting tissues, properties of cardiac muscle, cardiac cycle, heart sounds, ECG & its interpretation, Heart rate & regulation. Cardiac output, hemorrhage. Compensatory changes after hemorrhage. Blood pressure, cardiovascular modifications during exercise. Different types of circulation- foetal circulation, pulmonary, hepatic, capillary.

UNIT III

Endocrine System: Endocrine secretions, glands, role and regulatory functions of endocrine, site of secretions, regulation of secretions. Mechanism of action of hormones.

Reproductive System: Male and female reproductive system-organs, structure and functions. Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization, conception, implantation. Male and female contraceptions - Etiology of male and female infertility.

UNIT IV

Nervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR,Regulation of re-absorption.

11005P-PRACTICAL

Section-A

22. Demonstration of measuring BP using sphygmomanometer.
23. Determination/Identification of blood group and Rh factor.
24. Determination of TC of RBC & WBC
25. Determination of DC of WBC
26. Determination of ESR
27. Estimation of Hb by Sahlis Method.
28. Measurement of clotting time of blood

REFERENCES

28. Chatterjee.C.C, Human Physiology (11th edition), vol 1 & 2, Medical Allied Physiology (1987).
29. Guyton.A.C, Textbook of medical physiology, 9th edition, Philadelphia, WB Saunders, 1991.
30. Guyton AC, Function of Human Body, 4th dition, Philadelphia, WB Saunders, 1985.
31. Wilson.K.J.W & Waugh.A, 1996, Ross & Wilson Anatomy & Physiology in Health & illness, 8th edition, Church hill living stone.
32. Krause's Food, Nutrition and Diet Therapy, 10th Edition by Mahan, L.K. & Ecott-Stump, S. (2000), W.B. Saunders Ltd.
33. Nutrition - Concepts & Controversies, 8th Edition, bySizer, F. & Whitney, E. (2000): Wadsworth Thomson Learning.
34. Understanding Nutrition, 8th Edition, by Whitney, E.N. & Rolfes, S.R. (1999): WesV Wadsworth, an International Thomson Publishing Co.
35. Nutrition in Exercise and Sports, 3rd Edition by Ira Wolinsky (Ed) (1998): CRC Press.
36. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999):, Williams & Wilkin

11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Biomolecules – Introduction & Carbohydrates:

Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates:

Classification, structure, properties, Overview of Metabolism (Glycol sis/EMP pathway, Citric acid/Krebs cycle, Respiratory chain ,Gluconeogenesis, HMP pathway).

UNIT –II

Chemistry of Biomolecules-,Proteins and Lipids

Amino acids : Classification ,Structure of Amino acids .

Proteins : Classification ,structure, and properties of proteins (Primary, Secondary, Tertiary and Quaternary). Structure and biological functions of Fibrous proteins (keratine,Collagen), and Globular proteins(Hemoglobin, Meth hemoglobin).

Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids : Classification, structure and, properties of Lipids Overview of the Metabolism(β – Oxidation).

UNIT – III

Chemistry of Biomolecules-Enzymes and Vitamins

Enzymes: Enzymes as biological catalysts, IUB systems of classification, specific activity, K_m & V_{max} , evaluation. Line weaver Burk Plot. Effect of pH & temperature on enzyme catalyzed reactions, Enzyme inhibitors. Isoenzymes.

Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.

Vitamins –Water soluble and fat soluble vitamins and their physiological functions.

UNIT-IV

Chemistry of Biomolecules - DNA & RNA

DNA – double helical structure, Watson-Crick model of DNA .

A,B and Z types of DNA Nucleic acid-Denaturation and Renaturation of .DNA.

RNA-A brief out line of structure Functions of different types of RNA

11005P-PRACTICAL

Section-B

1. **Acid & Alkalis:** Preparation of Reagents and standard solutions-primary standards and secondary standards
2. **Buffers:** - Preparation of standard buffer solutions and determination of their pH
3. Estimation of glucose in blood.
4. Estimation of cholesterol in blood
5. Estimation of albumin in urine.
6. Estimation of creatinine in urine.

Reference Books:

34. Stryer E.A. , Biochemistry, Moscow, Mir Publications, 1989.
35. Zubay, Geoffrey L., Biochemistry, 4th Ed, Dudagey, IAWCB Wm. C. Brown Publishers, 1988, London.
36. Murray Robert, Harper`s Biochemistry, 24th Ed, Prentice Hall International UK Ltd, 1990.
37. Greenberg David M., Metabolic Pathways, Vol 3, 3rd Ed, Academic Press Pvt Ltd, New York.
38. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
39. SwaminathanM.,Essentials of Food and Nutrition, 2nd Ed, 1985, Ganesh and Co.
40. Gopalan C., et al, Dietary Allowances for Indians, NIH, Hyderabad.
41. Anita F.P., Clinical Dietetics and Nutrition, 4th Ed, 1997, Oxford Univ Press.
42. Lehninger Albert, 2001, Principles of Biochemistry, Kalyani Publishers, New Delhi.
43. Devlin, T.M., 1997, 4th Ed, Text Book of Biochemistry with Clinical Correlation, Wiley Liss Inc.
44. Vote and Voet, Fundamentals in Biochemistry.

11003 - NUTRACEUTICALS & FUNCTIONAL FOODS

(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II

Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III

Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV

Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

11006P – PRACTICAL

Section-A

1. Isolation of probiotic microorganisms.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
3. Estimation of antioxidants A, C, E.,
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices & canned foods.

REFERENCE

28. Mary, K. Schmidl and Theodore, P. Labuza , Essentials of Functional Foods, Culinary and hospitality industry publication services, 2000.
29. Mazza, G , Functional Foods- Biochemical and processing aspects, Culinary and hospitality industry publication services, 1998.
30. Israel Goldberg , Functional foods, Pharma foods, Nutraceuticals, Culinary and hospitality industry publication services, 2001.
31. Robert easy Wildman , Handbook of Nutraceuticals and Functional Foods, Culinary and hospitality industry publication services, 2001.
32. David, H.Watson , Performance, Functional Foods, Culinary and hospitality industry publication services, 2003.
33. Chatwick, R et al. , Functional Foods, Springer, 2003.
34. Jeffery Horst, Methods of Analysis for Functional Foods and Nutraceuticals, CRS Press, 2002.
35. Paresh, C. Dutta , Phytosterols as Functional Food Components and Nutraceuticals,
36. Marcel Dehker Inc, New York, 2004.

11004 - FOOD MICROBIOLOGY

(Prof. Dr. Sai Gopal)

UNIT I

Microorganism of importance in food - Their classification, morphology, growth, Reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II

Methods for isolation and detection of microorganisms and their products in food.

- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III

Food Spoilage-General principles underlying spoilage: Causes of Spoilage .Factors affecting food spoilage .

Microbial spoilage: Chemical Changes caused by different Microorganisms –

Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by

Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

Food preservation ;Principles of Food preservation ,methods of food preservation .

UNIT IV: Food Borne Diseases:

Viral :- Hepatitis, Poliomyelitis,

Bacterial:- Botulism, Salmonellosis,

Nonbacterial:- Mycotoxins, Aflatoxin, Patulin, Ochratoxin

Parasitic :- Tape worm, Ascaris

11006P – PRACTICALS

Section-B

16. Preparation of media-broth, solid media
17. Sterilization techniques: Dry and wet methods.
18. Identification of microorganisms by staining techniques- Simple, Gram & negative
19. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

19. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York, 5th edition, 1993.
20. Atlas M.Ronalds , Principles of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.
21. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.
22. Banwart , Basic food Microbiology, 2nd edition CBS Publisher, 1989. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.
23. Microbiology, by M. J. Pelczar, 4th edition, McGraw-Hill. Inc. N.Y. 1977.
24. General Microbiology, by R. Y. Steiner, 5th edition, Macmillan Education Ltd. London. 1987.

SEMESTER III
31001 - COMMUNITY NUTRITION
(Dr. Rajani)

UNIT I

Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

Nutrition Intervention Programmes- National and International Organizations - FAO, WHO, UNICEF, CARE, AFPRO, CWS, World Bank Integrated Child Development Services(ICDS) Programme, National prophylaxis programme for prevention of Blindness due to Vitamin-A deficiency, National Nutritional Anemia Control Programme, National Iodine deficiency Disorders Control Programme. Nutritional Surveillance, Role of Nutrition monitoring Bureau (NNMB).

UNIT III

Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

Food and Nutrition Security- Definition, Food Security determinations, Strategies to overcome Food insecurity. Role of Government and Non-governmental agencies in improving food security. Food security programmes, Food diversification, Food fortification.

31005P-PRACTICALS

Section -A

13. One week community nutrition camp & report
14. Planning, conducting and evaluating nutrition education programmes.
15. Assessment of nutritional status through anthropometry and dietary survey
16. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.

REFERENCES

40. Reddy.V; Rao.P.N; Sastry.G and Nath.K.K, Nutrition trends in India, NIN, Hydrabad.
41. Bamji, MS, Rao,MP; Reddy.V, “Textbook of human Nutrition”, Oxford and IBH Publishing Co, New Delhi.
42. Jeliffce.D.B, “Assessment of Nutritional Status of the community”, World Health Organisation, Geneva.
43. Swaminathan.M, “Principles of Nutrition and Dietetics”, Bangalore publishing company Ltd, Bangalore.
44. Park.K, “Park’s textbook of preventive and social medicine”, 16th edition, M/S ,BanarsidasBhanot publishers, Jabalpur.
45. WalRuchiMishra,S, Encyclopedia of Health Nutrition and family welfare, published by Sarup and sons, New Delhi 2000.
46. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.
47. Swaminathan, M.Handbook of Food and Nutrition, the Bangalore Printing and Publishing Co.Ltd, Fifth Edition, 2003.
48. Padmini Gupta, Ruchithakkar, Nutritional Disorders and Community Health, Pointer Ltd Publishers, Jaipur.
49. Venkataiah S.D. Nutrition Education, Anmol Publication Pvt, Ltd Reserved 2004.
50. MahtabS.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.
51. Reddy, R.S. Nutrition Education, Common Wealth Publisher, First Edition, 2004.
52. R. C. Mishra , Health and Nutrition Education, A. P.H. Publishing Corporation, New Delhi, 2005.

31002 - FOOD PROCESSING AND SAFETY

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I

Food Processing- Principles and Methods of processing :

Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.

Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II

Meat and Flesh foods: Smoking, drying, canning.

Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III

Food Adulteration - Foods commonly adulterated health hazards of adulterants ,simple identification tests of adulterants.

Food Additives- Emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV

Food Standards and laws

National food Laws, acts and implementing agencies FSSA, PFA,ISI, AGMARK, FPO etc.,

Role of Govt.in setting standards and quality control - Food quality control

Board, Technical Advisory committees, public health laboratories etc.,

International laws - ISO, CODEX.

31005P – PRACTICALS

Section - B

7. Visit to various food Industries.
8. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-

1. S.N. Mahindru, “ Food Safety- Concept and Reality”, APH Publishing corporation, 5 ansariroad, Daryaganj, New delhi-2004.
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing countryperspective, Mac millan India Ltd, 2005
3. Vanisha Nambiar, A Text book on “Food contamination and Safety “ ANMOL Publications Pvt.Ltd, New Delhi-2004
4. Amerine, M.A., Pangborn RM, and Roessler BB Principles of Senssy, Evaluation of foods, Academic press New York, 1965.
5. The prevention of food adulteratin Act, 1954 and Prevention of food adulteration Rules, 1955. (1998). Confederation of Indian Industry, New Delhi.
6. M. Swaminathan, Food Science & Eperimental foods (1979) Ganesh & Company - Chennai.
7. Development in Milling and baking Technology (1991) Association of food scientists & Technologists, Mysore.
8. The prevention of food Adulteration Act 1954 (1997) Eastern Book Company, Lucknow.
9. Dr. Ramesh V. Bhat and R. Nageswar Rao (1992) Food Safety in Public catering. NIN, ICMR, Hyderabad.

10. F.C. Blank, Hand book of food & nutrition (1999). AGRO Botanical Publishers, India.
11. Norman N. Potter, Joseph H. Hotchkiss (1996) Food Science 5th Edition.
CBS Publishers & Distibutors, New Delhi.
12. Ramesh V. Bhat & B.S. Narasinga Rao, National Strategy for food quality control (1985),
National Institute of Nutrition, ICMR, Hyderabad.
13. Perpinstrum - Anderson, World food trends and future food security (1994). Food Policy
Report, The International Food Policy Research Institute, Washington, D.C

31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trials and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

15. . Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment
16. To study the gluten formation.
17. Market Survey, Consumer survey
18. Quality analysis of packaged foods .
5. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES

31. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
32. Packaging technologies of functional foods *in* Functional food ingredients and Nutraceuticals processing technologies John Shi (Ed.) CRC Taylor & Francis group, 2007 for point 6.7.
33. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 21 page 495 for point 6.5.
34. Nutrition labeling handbook, Ralph Shapiro (Ed.), Marcel Dekker, N.Y., 1995 for point 6.8.
35. Dietary Supplements labeling-compliance review (third edition), James L. Summers (Ed.), Blackwell Publishing for point 6.8.
36. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapter 22 page 512 for point 6.6.
37. Functional foods, designer foods, pharma foods, Nutraceuticals, Israel Goldberg (Ed.), Aspen publishers Inc., Gaithersburg, Maryland, USA, 1999. Chapters 21, 22,23 & 24.
38. Biotechnology: Food Fermentation Vol I and II by Joshi and Pandey, 1999. Educational Publishers and Distributors, Kerala.
39. Food processing: Biotechnological Applications by Marvaha and Arora, 2000, Asiatech Publishers New Delhi.
40. Consumer's guide to Dietary supplements and alternative medicines servings of Hope, W. Marvin Davis, Pharmaceutical Products Press, 2006

31004-INSTRUMENTAL TECHNIQUES

UNIT- I

Ultraviolet and Visible Spectroscopy: Various electronic transitions(185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

Infra red spectroscopy :

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

Chromatography:

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

High performance liquid chromatography:

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

Electrophoresis :Migration of ions in electric fields of factors affecting electro phoretic mobility . Types of gels . Agarose gel electrophoresis and SDS-PAGE Electrophoresis and applications' .

PCR – Principle ,components in PCR and PCR conditions .Reverse transcription PCR .

.UNIT-IV:

Microscopy :Compound Microscopy :Numerical aperture and its importance ,Resolving power ,oil immersion objectives' and their significance principles and applications' of dark field ,phase contrast and fluorescent Microscopy

Electron microscopy –Principle ,ray diagram and applications . TEM,SEM Comparison between optical and Electron microscope ,limitations of Electron microscopy

31006 P – PRACTICALS

Section-B

1. Estimation of Protein by UV Spectra .
2. Paper Chromatography .
3. Thin layer Chromatography .
4. Agarose Gel Electrophoreses.
5. Estimation of Protein by Biuret method
6. Poly acryl amide Gel Electrophoresis
7. Differential staining –(Gram staining)

SEMESTER-IV

41001 – PROJECT WORK

Instead of project work extended period of internship and also included . Three theory papers to train up students to words professional aspects .

1. Paper- -I -Nutritional assessment
2. Paper –ii – Geatric nutrition
3. Paper-iii- Nutrition emergences in disaster

MODEL PAPERS -2018-2019

M.Sc.DEGREE EXAMINATIONS -

11001

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – I-Basics of Human physiology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|-------------------------------|------------------------------|
| 1. Functions of cell membrane | 5. Thyroid secretions |
| 2. Mitochondria. | 6.Female reproductive system |
| 3. Blood functions | 7.MRI |
| 4. ECG | 8.Nephron |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Explain about Structure as well as Functions of cell

OR

b). Give a detailed account on liver Anatomy and physiology .

10. a) Explain about gaseous exchange in lings and tissues.

OR

b)Discus on the blood groups ,blood coagulation, blood transfusion and erthroblastsis foetails.

11. a) What are the Regulatory functions of endocrines .

OR

b) Describe about Female reproductive system.

12. a) .Give a detailed structure about Kidney including its functions.

OR

b) Write in detail about structure of a nerve cell and its functions.

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – II-NUTRITIONAL BIOCHEMISTRY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

- | | |
|-------------------------------------|---|
| 1. Hendersen-Hasselbath equation | 5. Isoenzymes |
| 2. Structure of Homopolysaccharides | 6. Vitamin D and E |
| 3. Fibrous proteins | 7. Denaturation and renaturation of DNA |
| 4. Deamination | 8. Structure of t RNA |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9. a) Draw the cycle of HMP pathway and explain all the reactions

OR

b) Draw the cycle of Citric acid cycle and explain all the reactions

10. a) Give a details about classification and properties of Lipids

OR

b) Write about urea cycle and its regulations.

11. a) Write about Specific activity of Enzymes

OR

b) Write about water soluble vitamins and their physiological functions

12. a) Draw the Structure of Watson and Crick model of DNA and explain it

OR

b). Write about different types of DNA with their structures

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III –Nutraceuticals and Functional foods

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|---------------------|-------------------------|
| 1. Functional foods | 5.Diabetes mellitus |
| 2. Carotenoids | 6.Vitamina A deficiency |
| 3. Antioxidants. | 7.Diabeties Mellitus |
| 4.Probiotics | 8 .Designer foods |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a.)Write about importance of Nutraceuticals

OR

b) .Explain about cereal technology

10. a) Give information about structure and properties of antioxidants.

OR

b) Explain about pre and probiotics

11. a) Role of nutraceuticals in obesity management .

OR

b) Write in detail about structure , Properties and non nutrients detoxifying agents of functional foods

12. a) .Explain nutraceuticals of plant origin and their uses.

OR

b). Write about designer foods for degenerative diseases.

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER IV –FOOD MICROBIOLOGY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

- | | |
|-----------------------------------|------------------------------------|
| 1. Inhibitory substances | 5.contamination of food by insects |
| 2.Industrial importance of fungi. | 6.Food spoilage |
| 3. ELISA. | 7.Botulism. |
| 4.RFLP | 8.Aflatoxins. |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

- 9.a.) Write about microorganisms which are important in food microbiology
(or)
(b) Explain the Industrial importance of microorganisms
- 10a).How the microorganisms are isolated from the food.
(or)
(b).Give a detailed account on molecular methods for identification of microorganisms in food
- 11.a). Describe about factors affecting microbial growth.
(or)
b). Give details about the Physical and chemical spoilage of food by insects and rodents.
- 12.a)Write about Hepatitis and poliomyelites.
(or)
b) Write about the non bacterial food borne disease.

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – I-COMMUNITY NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

1. Write about biochemical methods of assessment .
2. Give about age specific mortality and morbidity rates
3. Explain about FAO .
4. Write an detail about WHO.
5. Explain about training the change agents.
6. Give an account on principles of planning nutrition education programmed.
7. What is food fortification ? Explain .
8. Explain about food diversification

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a).Elaborate on clinical assessment for various nutritional disorders

OR

B).Explain about classification used to categorize the malnutrition in children

10. a) Discuss about nutritional surveillance .

OR

b) Write national iodine deficiency disorders control program me

11. a). Give an account training the change agents

OR

b) .Plan a nutrition education for community on malnourished children.

12. a) .Write in detail about food security programmers.

OR

b).Elaborate on role of Government organizations agencies in improving food

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =

30M

- | | |
|--|-------------------------------|
| 1.What are the principles of food processing | 5. Define food adulteration ? |
| 2.Explain about germination | 6. Flavoring agents |
| 3. What is Smoking of flesh foods | 7. AGMARK |
| 4. Write about Blanching | 8. CODEX |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9.a). How to process Rice ? Describe.

OR

B). Explain in detail about pasteurization and methods of pasteurization

10. a) .Elaborate about processing of meat and flesh foods .

OR

b) .Explain about drying and fumigation of fruits and vegetables .

11. a) Discuss about commonly adulterer foods and their health hazards .

OR

b) Explain about sweeteners and preservatives.

12. a) Describe about food laws.

OR

b). Write in detail about role of government in setting standers and food quality control

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

- 1 Food product development
2. Explain Phases in food product development.
3. Write about nutraceuticals .
- 4 Define functional foods
5. Write optical properties of paper packaging in detail
6. Write about glass packaging material.
7. Dietary supplements.
8. Write in detail about food purchase habits of people

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

- 9.a). Elaborate about social and health concern on new product development.

OR

- B). Explain in detail about screening of food product development.

10. a) .Discuss the supercritical food extraction technology in development of functional foods .

OR

- b) . Write a brief note on new technologies in development of nutraceuticals development.

11. a) Describe the structure and properties of glass packaging material..

OR

- b) Explain in detail about concept of aseptic packaging foods.

12. a) Write in detail about food security programmes.

OR

- b). Elaborate on role of government organisations agencies in improving food security

M.Sc .DEGREE EXAMINATIONS

31004

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –IV-INSTRUMENTAL TECHNIQUES

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =

30M

1. Explain the following. (a).Bath chromic shift ,(b).Hyper chromic effect
2. How can you distinguish ketones, aldehydes, esters, amides, and acids by IR spectroscopy?
3. Write about TLC plate preparation
- 4 Write briefly about principle and applications of paper chromatography
5. Write about different types of Gels using in Electrophoresis technique
6. Write about factors effecting Electrophoretic mobility
7. Explain about Numerical aperture with diagram and write it's importance
8. Explain briefly about phase contrast microscopy and it's importance

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Write down wood ward –fisher rules for conjugated dines and carbonyl compounds in UV Spectrum

OR

B). Explain the importance of Finger print region in I.R Spectroscopy

10.a). Discuss about Column Chromatography

OR

B). Draw the diagram of HPLC, write the performance and advantages

11. a) Write the principle, procedure and applications of SDS - PAGE

OR

b). Write the principle, procedure and applications of PCR

12. a) Draw the ray diagram and explain about Fluorescent Microscopy

OR

b) Draw the ray diagram, sample preparation and applications of SEM

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – I-ESSENTIALS OF MACRO AND MICRO NUTRIENTS

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|--------------------------------|-------------------------|
| 1. Cereal grains | 5. Deficiency of sodium |
| 2. Essential amino acids | 6.Niacin |
| 3. Write about sources of fats | 7 .IDA |
| 4. Classification of foods | 8.IDD |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) write about characterization features and nutritive composition of pulses and nuts oil seeds

OR

b) Explain about the functions and nutritive value of foods

10. a) Describe the biological functions carbohydrates and effects of low intake .

OR

b) Write an account on functions carbohydrates and effects of low intake

11. a) Discuss the biochemical function, dietary requirements, sources of Calcium and phosphorus?

OR

b) explain the dietary requirement, biochemical functions and sources of Vitamin-D?

OR

12. a) Describe PEM and strategies to combat malnutrition with special reference to proteins .

OR

b) Explain the prevalence and Control strategies of Vitamin-A Deficiency?

TIME: 3hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 =30M.

1. Requirements of RDA
2. Importance of nutrients in growth and development
3. Endocrinology of lactation
4. Feeding of infants
5. Nutritional requirements of adult hood
6. Ageing process
7. FAMINES
8. Complications during space travel

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9 a) Give a detailed account on importance of nutrients during Lactation

OR

b). Write in detailed about importance of breast feeding.

10). a). Explain the growth and development and dietary management in childhood and Adolescence

OR

b) Write about human milk composition

11. a) Give a detailed account on nutritional related to heavy work

OR

b). Physical ,physiological and biological needs during old age

12. a) Explain in detail about nutrition during high altitudes

OR

b). Give a detailed account on nutrition during special needs like floods and famines.

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – III-CLINICAL AND THERAPETUC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M.

1. What is nutritional support ? explain
2. Complications and dietary management during dysentery
3. Renal stones
- 4.Liver transplant
5. Fructosuria
- 6.Phhenyl ketonuria
- 7.Effect of drug dosage food
- 8.Botulism

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a) what are the Gastro –intestinal disease .Explain with examples .

OR

b) . Explain Progressive Diet –general ,Modified diets and Nutritional support special feeding methods

10). A). Describe about nephritic syndrome

OR

b) . Describe about Kidney transplant & dietary management .

11. a) .Explain Metabolic & clinical aberrations ,complications . prevention and dietary management of Neurological disorders

OR

b) .Explain bacterial diseases with examples .

OR

12. a) .Explain in detail about nutrient and drug interaction

OR

b).Effect of drug on metabolism of nutrients .

21004 - BIOSTATISTICS AND RESEARCH MET

M.Sc.DEGREE EXAMINATIONS

21004A

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –IV –Biostatistics and Research methodology

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- 1,Standard deviation
- 2.Types of random variables
3. Alternative hypothesis
4. STATISTICA
5. Stages of execution of research
6. Poster presentation
7. Impact factor
- 8.patents

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

- 9.). How can you tabulate and present a data
- B).Explain random variable .
10. a.) Write about the Chi –square test

OR

- b). Give a brief account on small sample tests
11. a).Explain the choosing the problem for research
- b). Write short notes on (A) Logical format for writing (B). Essential features of abstract
12. a) . Write in detail about effective illustration of tables and figures

(OR)

- b). Explain in detail world intellectual property rights organization

BRANCH: Human nutrition and Nutraceutical Chemistry

IV SEMESTER

PAPER –I-NUTRITIONAL ASSESEMENT

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. $6 \times 5 = 30$

1. Anthropometric assessment
2. Types of dietary surveys
3. Protein quality
4. Net protein utilization (NPU).
5. Growth studies
6. PER
7. Case study
8. Nitrogen balance studies

Section – II

Answer ALL questions. Each question carries 10 marks $4 \times 10 = 40$

9.a) Classify direct methods of nutritional assessment and explain in nutritional surveys .

OR

b). Briefly explain the clinical assessment an clinical signs in various disorders.

10. a). Discuss the methds of estimation of protein quality & protein efficiency ratio (NPR)

OR

b).1. Net protein ratio 2. Net dietary protein calories percent (NDPCP)

11. a). Role of different protein levels briefly explain .

OR

b) . Explain in detail infants on feeding methods .

12. a) . Children's ,adolescents and adults procedure briefly explain .

(OR)

b) 1. Maintain of animal laboratory

2. calculations of endogenous nitrogen

BRANCH: Human nutrition and Nutraceutical Chemistry

IV SEMESTER

PAPER –II-GERIATRIC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

- | | |
|--------------------------|---------------------------------|
| 1. Ageing | 5. Chronic degenerative disease |
| 2. Physiological changes | 6. NGO |
| 3. Dietary management | 7. Nutrition health problems |
| 4. Menopausal | 8. Genesis life style . |

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Briefly explain the process of ageing and classify the types .

OR

b).Definition of Geriatric nutrition and explain .

10. a). food and nutrition needs of elderly and dietary management .

OR

b).Special problems of women menopausal ,post menopausal problems

11. a).Briefly explain chronic degenerative disease and nutrition health problems

OR

b) . Definition of Geriatric nutrition and explain .

12. a) . Genesis life style and living conditions ,management prevention control .

(OR).

b) OLD AGE HOMES –day care and recreation centres their need and scope

BRANCH: Human nutrition and Nutraceutical Chemistry

IV SEMESTER

PAPER –III-NUTRITION IN EMERGENCIES AND ISASTERS

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30

- | | |
|------------------|--------------------------|
| 1. Disasters | 5. Rehabilitation |
| 2. Sanitation | 6. Food distribution |
| 3. Malnutrition | 7. Therapeutic feeding |
| 4. Anthropometry | 8. Types of epidemiology |

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40

9.a) Write about natural and manmade disasters .

OR

b). Discuss about vitamin-d deficiency disasters

10. a). How to assess nutritional status

OR

b). Write about communicable disease

11. a). Explain assessment of food needs in emergency situations .

OR

b) .Briefly explain mass and supplementary feeding

12. a) . 1. Cross sectional analysis 2. Principles of nutritional epidemiology .

(OR).

b) Explain about public nutrition approach to tackle nutritional problems in emergencies

The Board of Studies members was suggested to replace project work with three theory and practical papers, those which are applicable for survey and nutritional assessment.

Here the time period of internship was prolonged up to 3 months, which is a very useful for students in getting employability in hospitals as Nutritionist.

Semester –iv

41001 Nutritional assessment

UNIT-I

Assessments of Nutritional status:

Direct methods-Anthropometric, Biochemical, Clinical, Dietary assessments.

Anthropometric assessment: Introduction, Definition, Methods of measurements, Standardizations Classification of Nutritional status.

Biochemical assessment: Need for Biochemical test, Interpretation of biochemical test, Types of test.

Clinical assessments: Assessment of clinical signs in various disorders.

Dietary Assessments: Types of Diet surveys, methods of Diet surveys, analysis and interpretation, problems in Diet surveys and solutions.

Indirect method: Vital statistics and other Records

UNIT II

Methods of estimation of protein quality:

Protein efficiency ratio (PER), Digestibility co efficient, Biological value (BV), Net Protein Utilization (NPU), Net protein Ratio (NPR), Chemical score, protein Digestibility corrected Amino Acid Score (PDCAAS), Net Dietary Protein Calories Percent (NDPCP).

UNIT III

Growth studies: animal models:

Role of animal models in nutrition research; need for extrapolation of animal research results to human populations; Maintenance of animal laboratory; maintenance of records; Principles of formulation of diets- classification and composition.

Growth and development of rats- role of different protein levels of the diet protein sources of the diet- body weight changes- feeding techniques- calculation of PER.

Biological Assays with animal models: metabolic and balance studies: (for protein quality):

Biological value- formulation of objectives, composition of diets- collections of urine and fecal, food intake assessment, determination of food and urine and fecal nitrogen – calculations of endogenous nitrogen – digestibility co-efficient (DC) and Biological value

(BV).

UNIT IV

Growth and metabolic studies with Human subjects:

Principles, objectives.

Growth studies with infants on feeding different protein sources. (case study experiences and report of research studies)

Growth studies with preschool children, school children and adolescents: Effect of supplementation

Nitrogen balance studies, in growing children, adolescents and adults- Procedure for conducting metabolic and balance studies and interpretation of results.

Practicals 41005P: Survey on Nutritional status : Analysis, Report writing. ----50M

REFERENCE BOOKS AND TEXT BOOKS:

1. Swaminathan M. (1995).Advanced Text book on "Food and Nutrition" (Applied aspects) Vol. II BAPPCO, The Bangalore Printing and Publishing Co. Ltd., (Chapters 21, 24) Bangalore.
2. Tara Gopaldas and SubhadraSeshadri. (1997). Nutrition, Monitoring and assessment, Oxford University Press, New Delhi .
3. Whitney. E.N, and S.R.Rolfes. (1999). `Understanding Nutrition', (8th edition) Chap. 6 and Appendix `J'.Measures of Protein Quality - West/Wadsworth.
4. Ruth .L. Pyke and Myrtle .L. Brown. (1997). Nutrition an Integrated approach, Chapter 15, Wiley eastern Publications, New York.
5. Manual (WHO) Measuring Change in Nutritional Status. WHO, Geneva - 1983.
33
6. Mayanard, L.A and J.K. Loosli. (1992). Animal Nutrition, 5th edition McGraw Hill book company, New York
7. George. H. Beaton and E.W. Mchenery. (1964). "Nutrition" Vol I, II and III, Academic Press. INC: London,
8. Channey M.S. and M.L.Ross. (1979). Nutrition, 8th edition surgeetpublication : 7.K.Kolhapur Road, Delhi,

41002- GERIATRIC NUTRITION

UNIT-I:

The process of Ageing – Physiological biochemical and body compositional changes – Theories of ageing. Socio-cultural and psychological aspects of ageing – Health seeking behavior of the elderly.

UNIT-II:

Food and Nutritional needs of the elderly – Dietary management – Special problem of women – menopausal, post-menopausal. Problems; Early nutrition and nutrition and health in later years.

UNIT-III:

Chronic degenerative diseases and nutrition and health problems of the elderly – their etiology – genesis life style and living condition, management, prevention and control.

UNIT-IV

Policies and programmes of the government and NGO sectors pertaining to the elderly – old age homes – Day care and recreation centers – their need and scope.

Practicals 41005P: Case study : Analysis, Report writing.----- 50M

REFERENCE:

- Kumar, V. (1996): Aging – Indian Perspective and Global Scenario, Proceedings of International symposium of Gerontology and Seventh Conference of the Association Gerontology (India)
- Bagchi, K.and Puri, S. (Ed)(1999): Diet and Aging-Exploring Some Facets, Soc. For Gerontological Research, New Delhi and Help Age India, New Delhi.
- Chaudary, A.(Ed)(2001): Active Aging in the New Millennium, Pub. Anugraha, Delhi.
- Shils, M.E., Olson, A.J.A., Shike, M. and Ross, A.C.(Ed)(1999): 9th Edition, Williams and Wilking.
- Sharma, O.P. (Ed.) (1999): Geriatric Care in India – Geriatrics and Gerontology: A Textbook, M/S. ANB Publishers.
- Aiken, L.R.(1978): The Psychology of Later Life, Philadelphia WB Saunders Company.
- Bergmann, Klaus (1972): Aged: Their Understanding and Care, London Wolfe Pub.

41003- NUTRITION IN EMERGENCIES AND DISASTERS

UNIT-I

Natural/Manmade disasters resulting in emergency situations:

- Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies.
- Factors giving rise to emergency situation in these disasters.
- Illustration using case studies from Indian subcontinent

Nutritional problems in emergencies in vulnerable groups

Causes of malnutrition in emergency situations

Major deficiency diseases in emergencies

Protein – Energy Malnutrition / Starvation / Under Nutrition.

Specific Nutrient deficiencies - Energy, Vitamins, Minerals

Communicable disease: Surveillance and treatment.

Control of communicable diseases in emergencies – Role of immunization and sanitation.

UNIT-II

Assessment and surveillance of Nutritional status in emergency affected populations.

Scope of assessment of malnutrition in emergencies

Indicators of malnutrition. Clinical signs for screening acute malnutrition

Anthropometric assessment of nutritional status. Indicators and cut-offs indicating seriously abnormal nutrition situation: Weight for height based indices, MUAC, social indicators.

Organization of nutritional surveillance and individual screening.

UNIT-III

Nutritional Relief and Rehabilitation

Assessment of food needs in emergency situations

Food distribution strategy – Identifying and reaching the vulnerable group –

Targeting Food Aid.

Mass and Supplementary Feeding

Therapeutic Feeding

Special foods/rations for nutritional relief

Local production of special foods

Local foods in rehabilitation

Organization of mass feeding/general food distribution

Feeding centers

Transportation and food storage

Sanitation and hygiene,

Evaluation of feeding programmes

Household food security and nutrition in emergencies

Public nutrition approach to tackle nutritional problems in emergencies

UNIT-IV

Introduction to Epidemiology – types of epidemiology, collection of epidemiological data, secondary routine data, Descriptive epidemiology, Cross sectional Analysis, prevalence and incidence, risk factors, risks and odds, relative and attributable risks Principles of Nutritional Epidemiology, Measurement issues, Measurement of disease, Occurrence and Measurements of association, Exposure and outcome, Socio demographic and Psycho social variables.
Design and Planning of Nutritional Epidemiological studies – assessing and supplying And Evaluating Epidemiological studies – Discussion of selected case studies

Practicals 41006P: Seminars -----

10X5 = 50M

REFERENCE:

World Disasters Report – Focus on Public Health, International Federation of Red Cross and Red Crescent Societies.
Disasters – International Public Nutrition and Emergencies: The Potential for improving practice. Special Issue – Vol.23/4, Dec. 1999.
Guidelines and Research publications of OXFAM, WFP, Rome. 1999.
Nutrient Requirements and Recommended Dietary Allowance for Indians A Report of the Expert Group of ICMR. 2010.
Dr.M Swami Nathan. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.
Shubhangini A.Joshi. (2010). Nutrition and Dietetics Third Edition Tata Mecgraw Hill Education Private Limited New Delhi.

41004 Internship ----- 150M

It is proposed to include internship as field work for time duration of one month at near by hospitals as dietitian .

