

Food
1.1.3
52 Hrs

Unit-1 : Standard solutions

Familiarization to terms and calculations used in preparation of various standard solutions.

15 Hrs

Unit-2 : Instrument Methods of analysis

Sample and sampling techniques, principles, techniques and applications of colorimetric, spectrophotometer and atomic absorption spectro-photometer, fluorimetry, flame photometry, electrophoresis and different methods of chromatography.

15 Hrs

Unit-3 :

Introduction to animal assay.

Techniques in separation of biomolecules and tracer techniques in biology – radioactivity.

22 Hrs

PRACTICAL:

Handling of equipment and instruments; preparation of samples, solutions and buffers; quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of colorimeter, spectrophotometer, flame photometry, UV spectrophotometer, different methods of chromatography, techniques in fractionation of proteins.

SUGGESTED READINGS:

AQAC, 1995, Association of Official Analytical Chemist. Washington, DC. Gruenwedels, D.W. and Whitaker, J.R., 1984, Food Analysis: Principles and Techniques Vols. 1-8. Marcel Dekker.
 Joslyn, M.A., 1970, Methods in Food Analysis: Physical, Chemical and instrumental methods of analysis. Academic press.
 Pomeranz, Y. and Molean, C.E., 1997, Food Analysis Theory and Practice. AVI Publ.
 Sawhney, S.K. and Singh. R., 2000, Introductory Practical Biochemistry. Narosa.

1.1-3

Objectives:

The course will enable the students to:

- Understand the etiology, physiologic and metabolic abnormalities of acute and chronic diseases and patient needs.
- To assess nutritional status of patients.
- Be familiar with recent advances in the medical nutritional management of various diseases.

Topics and Details

Unit I Cellular adaptations to stress.

Types of stress

Changes in hormonal secretion, CNS and immune system.

Cellular changes. Effects on cells and tissues

Nutritional screening and assessment of nutritional status of hospitalized and outdoor patients. Identification of high risk patients. Assessment of patient needs based on interpretation of patient data-clinical, biochemical, biophysical, personal etc.

13 Hours.

Unit II :Nutritional counseling

Newer trends in delivery of nutritional care and dietary counseling. Nutritional Support-Recent advances in techniques and feeding substrats.

13 Hours

Unit III : Diet, Nutrient and Drug interactions.

Effect of drugs on ingestion, digestion, absorption and metabolism of food and nutrients.

Effect of food, nutrients and nutritional status on drug dosage and efficacy.

Nutrition and immunity:Role of individual nutrients in immune response and function.

13 Hours

Effect of under and over nutrition on immune function.

Immuno enhancers, Immuno suppressants, conditionally essential nutrients.

Etiopathophysiology, metabolic and clinical observations, and recent advances and implications for medical nutritional managements of:

Cardio vascular disorder

.Diabetes mellitus

GI Tract Disorders

Renal disorders

Cancer

Osteoporosis

HIV/AIDS

13 Hours

Practicals:

1. Analysis of blood for
 - a) Glucose
 - b) Hemoglobin, total Cholesterol lipid profile

- c) Serum A/G ratio
- d) Serum phospholipids
- e) Serum Protein
- f) Serum alkaline phosphatase
- g) Serum Bilirubin/.
- h) Enzymes

1.13

References:

1. Mahan, L.K. and Escott-Stump, S.(2000) Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.,
2. Shils, M.E. Olson, J.A. shike, M. and Ross, A.C. (1999), Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump. S, (1998), Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
4. Garrow, J.S. James, W.P.T. and Ralph, A (2000), Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
5. Williams, S.R. (1993) Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
6. Davis, J. and Sherer, K. (1994) Applied Nutrition and Diet Therapy for Nurses. 2nd Edition. W.B. Saunders Co.,
7. Walker, W.A. and Watkins, J.B.(Ed) (1985) Nutrition in Pediatrics. Boston. Little. Brown & Co.,
8. Guyton, A.C. and Hall, J.E. (1999) Textbook of Medical Physiology, 9th Edition. W.B. Saunders Co.,
9. Ritchie, A.C (1990). Boyd's Textbook of pathology. 9th Edition. Lea and Febiger, Philadelphia.
10. Fauci, S.A et al (1998). Harrison's Principles of Intenal Medicince. 14th Edition, McGraw Hill.
11. World Cancer Research Fund (1997) Food, Nutrition and the Prevention of Cancer-A Global perspective, Washignton E.D. WCRF.

Journals and Other Reference Series:

1. nutrition Update Series
2. World Review of Nutrition and Dietetics
3. Journal of the American Dietetic Association
4. American Journal of Clinical Nutrition
5. European journal of Clinical Nutrition
6. nutrition Reviews.

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FSN: 3.3 FOOD SAFETY AND QUALITY ASSURANCE

52 Hours

Objectives:

This course will enable students to:

- Know the importance of quality assurance in food industry.
- Be able to conduct various tests and asses quality, using standards for quality assessment and food safety.
- Be able to conduct the various tests used to detedt food adulterants.
- Be familiar with the fundamentals that should be considered for successful quality control programme.

Topics and Details		No. of Hours.
Unit I	Introduction & Significance of Food Toxicology, Food Poisoning, Types	05 Hours.
Unit-II	Introduction to quality assurance and food safety. Current concepts of quality control Quality Assurance Programme: Quality plan, documentation of records, product standards, product and purchase specifications, process control and HACCP, hygiene and housekeeping, corrective action, quality and programme and total quality process.	10 Hours

Unit-II Process Evaluation: 12 Hours

- Sampling for product evaluation and line control.
- Statistical quality and process control
- Specifications and food standards. International, national-
Mandatory, voluntary.
- Sample preparation.
- Reporting results and reliability of analysis.

Unit-III Assessment of purity and quality using appropriate standard tests for the following: 15 Hours

- mineral water.
- including butter, ghee
- Ice creams and sherbets
- Cereals and cereal products
- Pulses and legumes
- Spices and condiments and salt, pickles, sauces and chutneys.
- Tea and coffee
- Canned, dehydrated, frozen and bottled fruit/vegetable products
- Confectionery
- Flesh foods
- Specific food ingredients such as glycerine, vinegar.
- Fruit juices, concentrates and beverages.

Unit-IV Detection/Estimation of Food Additives and Contaminants-qualitative and quantitative demonstrations 10 Hours

1.1.3

References:

1. Early, R. (1995). Guide to quality management systems for the Food Industry, Blackie, Academic and Professional, London.
2. Gould, W.A. and Gould, R.W. (1988). Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
3. Pomeranz, Y. and MeLoan, C.E. (1996). Food Analysis. Theory and Practice, CBS Publishers and Distributor, New Delhi.
4. Askar, A and Treptow, H. (1993), Quality Assurance in Tropical Fruit Processing. Springer-Verlag, Berlin.
5. World Health Organisation (1998). Guidelines for Drinking Water Quality, 2nd edition, Vols. 1,2, and 3, Geneva.
6. Marth, E.H.(1978) Standard Methods for the Examination of Dairy Products 14th edition. Interdisciplinary Books and Periodicals, Washington, D.S.
7. Ranganna, S. (1986) Handbook of analysis and quality control for Fruit and Vegetable Products, 2nd edition, Tata Mcgraw Hill Publishing Co. Ltd., New Delhi.
8. Hagstad, H.V. and Hubbert, W.T (1986) Food Quality Control, Foods of Animal Origin Iowa State University Press, AMES.
9. Nielsen, S.S, (1995) Analytical Chemistry of Foods, Blackie Academic and Professional (Capman and Hall), Madras.
10. James. C.S (1995), Analytical Chemistry of Foods, Blackie Academic and Professional (Chapman and Hall), Madras.

FSN: 4.3 DIET DESIGNING IN DISEASES

52 Hours

Objectives:

To enable the students to:

1. Understand the role of nutrition for good health.
2. Obtain knowledge on different therapeutic diets and their preparation.
3. Develop capacity and aptitude for taking up dietetics as a profession.

THEORY:

Unit-1: Introduction to the therapeutics diets *Unit 4*

(Role of dietician in the hospital and community. Routine hospital diets. Liquid diet, soft diet, full diet, clear liquid diet) and tube feedings, calculation and planning of modified diets according to medical prescription and food habits of the patients.

Commonly used special diets: Study on the commonly used special diets Karell's diet, Kempner's diet, Sippy's diet, Meulangratchris diet, Lanhartz diet, Anderson's diet. 13 Hours

Unit-2:

Modification of diet:

Modification of diets in relation to: Surgical conditions, cancer, febrile conditions, gastrointestinal disorders including those of the liver, endocrine disorders including diabetes mellitus, hypothyroidism, gout, obesity and underweight, cardiovascular diseases, renal disorders, elementary knowledge on diet in rheumatism, arthritis, skin diseases and allergic conditions.

Feeding the patient: Psychology of feeding the patient. Assessment of patient's needs education of the patient and follow-up. 20 Hours

Unit-3: Inborn errors of metabolism:

Phenyl Ketonuria, Tyrosinemia, maple syrup urine disease, homocystinuria, Lucien induced hypoglycemia, galactosemia, hereditary fructose intolerance, Wilson's disease, familial hypercholesterolemia.

Meal and menu planning: Principles involved in planning menus. Techniques of writing menus, formal and informal food service management in hospitals. Types of service: table, dining room; management, delivery and service of food in different systems, centralized and decentralized systems of service. 13 Hours

Unit-4: Nutrition during environmental stress conditions

Nutrition during food, famine and drought, high altitudes, for space travel, for heavy manual labourer in tropics, during nutritional emergency and rehabilitation.

06 Hours

PRACTICALS:

Experience in calculating, planning and preparation of therapeutic diets for the following conditions: peptic ulcer, cirrhosis of Liver, heart diseases, diabetes mellitus, anemia, Kidney disease, kwashiorkor, marasmus, febrile conditions and obesity. Underweight, Cancer, Infant Feeding

References:

1. Davidson, S. Passmore, R. Breck, J.F. and Truswell Human Nutrition and Dietetics. The English Language Book Society and Churchill Livingstone, 1975.
2. Robinson, C.H. Normal and Therapeutic Nutrition. Oxford and III Publishing Co., Calcutta, Bombay. 1972.
3. Krause, M.V. and Hunscher M.A. Food Nutrition and Diet Therapy W.D. Saunder C., Philadephia, London, Toronto, 1972.
4. Swaminathan, M. Essentials of Food and Nutrition, Vol I & III Ganesh & Co., 1974.
5. Howe, P.S., Basic Nutrition in Health and disease, W.B. Saunders Co., Philadelphia, London, Toronts 1971.
6. William S.R. Nutrition and Diet Therapy. The C.V. Mosby Company, St.Louis 1973.
7. Antia F.P. Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 1973.
8. Manual of Dietetic Practice. Blackwell Scientific Publications. Oxford London. 1988.
9. Brown M.L., Present Knowledge in Nutrition. International Life Sciences Institute ILSI Press, Washington, D.C. 1990.
10. The Journal of Nutrition. American Society for Nutritional Science. Nutrition Review ILSI. Washington. D.C.
11. The Indian journal of Nutrition and Dietetics, Avinashalingam Institute for Home Science and Higher Education for Women-University, Cjombatore.
12. Research Highlights_J. of Avinashlingam Institute of Home Science and Higher Educational for Women- University, Coimbatore.

1.1.3

III SEMESTER

FPN – HCT 3.1: CLINICAL NUTRITION

Theory

52 hours

Course Objectives

- To impart understanding of the pathophysiological processes of various organ systems in the body
- To acquaint with the knowledge of clinical parameters for the nutrition management of the diseases
- To provide technical acquaintance for comprehensive nutritional assessment in clinical settings

UNIT I

10 hours

Nutritional screening and assessment of nutritional status of patients. Assessment of patient needs based on interpretation of patient data: clinical, biochemical, biophysical, personal etc.

UNIT II

10 hours

Nutritional support systems

Enteral and parenteral nutrition: Site, Size of the tube, Feed-types, composition, Complications. Recent advances in techniques and feeding substrates. Newer trends in nutritional counselling

UNIT III

16 hours

Medical Nutrition Therapy in the management of

- Stress conditions
- Fever
- Cardiovascular disease
- Gastrointestinal diseases
- Diabetes mellitus
- Renal diseases
- Cancer
- Osteoporosis
- HIV/AIDS

UNIT IV

16 hours

Diet, nutrient and drug interaction: effects of drugs on food intake, nutrient absorption, metabolism and requirement; Effect of food, nutrients and nutritional status on absorption and metabolism of drugs.

Nutrition and immunity: role of individual nutrients in immune response and function.

Practicals

1. Analysis of blood for
 2. glucose
 3. total cholesterol
 4. lipid profile
 5. proteins
 6. minerals
 7. vitamins
 8. alkaline phosphatase
 9. bilirubin
- 10 Demonstration study of ECG, ECHO, Dialysis

Learning outcomes

After completion of the course, the students will able to

- Collect pertinent information for comprehensive nutrition assessment
- Interpret the clinical parameters for planning the nutritional therapy for medical conditions
- Determine medical nutrition therapy for a various medical conditions
- Use the Nutrition Care Process to make decisions, identify nutrition-related problems and determine and evaluate nutrition interventions.

References

1. Maurice E. Shils, Modern Nutrition in Health and Disease 10th edition
2. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
3. Nutritional biochemistry of vitamins David a bendor.
4. Achayya, K.T., (1998), A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
5. Mahindru, S.N. (2002), Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
6. Present Knowledge in Nutrition – latest edition. International Life Sciences Institute.

Theory

52 hours

Objectives:

- To reduce the incidence of mortality, morbidity, malnutrition and school drop outs
- To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.
- To improve overall nutritional status of the vulnerable group
- To overcome specific nutritional deficiencies among mothers and children
- To help to achieve better nutrition through indirect schemes

UNIT I

8 hours

Scope of community nutrition. Food habits. Economic, social and cultural factors influencing food fallacies and fads. Malnutrition among vulnerable groups. Growth monitoring. Assessment of nutritional status- Direct and indirect methods-anthropometry, dietary, clinical, biochemical and vital statistics. Indicators of Health and Nutrition (ICMR, TMR, MMR)

UNIT II

15 hours

Nutritional problems prevalent in India and measures to combat. National nutrition programmes. Projects related to community nutrition; Government and non-government. Food security – definition, national and household food security, factors affecting food security system. Objectives and functions of national, international agencies and voluntary organizations.

UNIT III

15 hours

Nutritional policy and programs- National nutrition policy-need for nutrition policy, policy strategies-and their implementation. Nutrition programs, National Anemia prevention Prevention of night blindness, National Iodine prophylaxis program. ICDS. National nutrition surveillance system. Food for work etc. NGO in community development operations.

UNIT IV

14 hours

Nutrition intervention Definition, importance, methods of nutrition intervention and their impact evaluation. Nutrition education-Rationale, planning, Execution and evaluation
Food adulteration - adulterants and methods of detection. Food laws in India and consumer protection.

Practicals

1. Study of existing diet and nutritional practices
2. Assessment of nutritional status of an individual/community by using anthropometry and dietary survey.
3. Orientation to a) Preparation of schedule B) Survey work C) Analysis of data D) Writing of report.
4. Visit to local health centre to identify clinical signs and symptoms of nutritional problems.
5. Identification of adulterants in common foods.

6. Visit to an ICDS Block. Development of audio visual aids- radio script; popular article; chart/posters leaflets etc.
7. Study tour to community nutrition related NGO'S and other institutes.
8. Planning, implementation and evaluation of nutrition education for a target group.

Learning outcomes:

- Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of communities.
- Determine and translate nutrient needs into menus for individuals and groups across the lifespan, in diverse cultures and religions, and for different income levels.
- Plan a community intervention based upon a needs assessment
- Advocate for a public policy related to nutrition programs or health care

References:

1. Textbook of Community Nutrition Hardcover – 2007 by Salil & Rita S Raghuvanshi Sehgal (Author)
2. Textbook OF Community Nutrition , Suryatapa Das
3. IGNOU Nutrition For The Community (ANC 1) In English Medium Including Solved Question Papers (Hardbinding, Expert pannel of Neeraj Publication)

II SEMESTER

FPN – HCT 2.1: FOOD AND INDUSTRIAL MICROBIOLOGY

Theory

52 Hours

Objectives:

- Understand the interactions between microorganisms and food
- Understand the basics of causes and consequences of food contamination
- Understand the basics of methods of preservation and industrial production of certain fermented foods
- Develop skills in identification, testing and control of microorganisms in relation to food safety.

Unit I

4 hours

Introduction and scope; Food Microbiology – A many faceted science; Interrelationship of food microbiology with other sciences; Perspectives on food safety and Food Biotechnology

Unit II

18 hours

Factors of special significance in Food Microbiology – Principles influencing microbial growth in foods; Spores and their significance; Indicator organisms and Microbiological criteria; Microbial spoilage of foods- meat, milk, fruits, vegetables and their products; Food poisoning and food-borne pathogenic bacteria.

Unit III

15 hours

Food fermentation: Fermented dairy, vegetable, meat products; Preservatives and preservation methods – physical methods, chemical preservatives and natural antimicrobial compounds. Bacteriocins and their applications; Biologically based preservation systems and probiotic bacteria.

Unit IV

15 hours

Biofermentor: Production of wine, beer, lactic acid, acetic acid (vinegar), citric acid, antibiotics, enzymes, vitamins and single cell proteins. Biofuels: Production of ethanol, biogas and hydrogen production. Advanced techniques in detecting food-borne pathogens and toxins. Hurdle technology and Hazard analysis. Critical control point systems in controlling microbiological hazards in foods.

Practicals

1. Study of microscope
2. Simple and differential staining techniques, observation of bacteria, yeasts, actinomylates algae and fungi
3. Preparation of media and sterilization techniques for media and glasswares
4. Isolation of microorganisms from different sources using different techniques and pure culture techniques
5. Isolation and enumeration of microorganisms from grains, fruits and vegetables
6. Bacteriological examination of milk and milk products
7. Preparation of wine and sauerkraut
8. Leavening of bread
9. Preparation of spawn and cultivation of mushroom
10. Bacteriological examination of water
11. Microflora of utensils and food handlers
12. Visit to breweries and food industry

Learning Outcomes:

students are expected to be able to:

- Understand the beneficial role of microorganisms in fermented foods and in food processing and the microbiology of different types of fermented food products – dairy, pickles, Legume and cereal based food products
- Understand the significance and activities of microorganisms in food and role of intrinsic and extrinsic factors on growth and survival of microorganisms in foods
- Know the spoilage mechanisms in foods and thus identify methods to control deterioration and spoilage
- Recognize and describe the characteristics of important pathogens and spoilage microorganisms in foods.
- Learn various methods for their isolation, detection and identification of microorganisms in food and employ in industries
- Identify ways to control microorganisms in foods and thus know the principles involving various methods of food preservation
- Understand of the basis of food safety regulations and Discuss the rationale for the use of standard methods and procedures for the microbiological analysis of food.

REFERENCES

1. Anantanarayan R., and Jayaram Paniker C.K., Textbook of Microbioligy, Orient Lognman Pvt. Ltd., Hyderabad, 2005.
2. Doyle P. Michael, Beuchat R. L. and Montiville J.T. Food Microbiology-Fundamentals & Frontiers, ASM Press, Washington D.C.,2001.
3. Talaco K and Talaco A., Foundations in Microbiology, WCB publications, USA, 1993.
4. Steinkrans, K. H., (1996), Hand book of indigenous fermented foods, 2nd ed., Marcel Dekker, Inc, New York.
5. Pelezar, M. L. and Reid, R. D. (1993) Microbiology, McGraw Hill book Company, New York. 5th Edition.
6. Atlas, M. Ronald, (1995), Principls of Microbioligy, Ist Edition, Mosby-Year Book,Inc., Missouri, U.S.A.
7. Topley and Wislson's (1983) Priniciples of Bacteriology, Virology and Immunity, Edited by S.G. Wilson, A Miles and M.T. Parker, Vol. I: General Microbiology and Immunity, II:Sustematic Bactyeiology. 7th Edition, Edward, Arnold Publisher.
8. Block, J. G. (1999), Microbiology Principles and Explorations, 4th Edition Hohn Wiley and Sone Inc.
9. Frazier, W. C. (1988) Food Microbiology, Mc Graw Hill Inc. 4th Edition.
10. Jay, James, m. (2000) Modern Food Microbiology, 6th Edition. Aspen publishers, Inc., Maryland.
11. Banwart, G. (1989) Basic Food Microbiology, 2nd Edition, CBS Publisher.
12. Garbutt, J. (1997) Essentials of Food Microbiology, Ist Edition, Arnold International students Edition.
13. Doyle, P. Benehat, L.R. and Mantville, T.J. (1997): Food Microbiology, Fundamentals and Frontiers, ASM Press, Washington DC.
14. Adams, M.R and M.G. Moss (1995) Food Microbiology, Ist Edition, New Age international (P) Ltd.
15. Bibek Ray.1996. Fundamentals of Food Microbiology. CRC Press.
16. 2. Frazier WC & Westhoff DC. 1991. Food Microbiology.
17. 3. 3rd Ed. Tata McGraw Hill. 3. George J Banwart. 1989. Basic Food Microbiology. AVI.
18. 4. James M Jay. 1987. Modern Food Microbiology. CBS.
19. 5. Peppler HJ & Perlman D.1979. Microbial Technology. 2nd Ed. Academic Press.

1.1.3

FPN – HCT 2.2: FOOD ANALYSIS

Theory

52 Hours

Objectives

- To acquire knowledgeable of food components and characteristics and techniques available for their analysis
- To learn the basic principles of colorimetric, chromatographic and spectrometric analyses applied in the analysis of foods
- To choose appropriate methods for the analyte and/or food system of interest and interpret analytical data including use of common calculations, and resources relevant to food analysis
- To acquire laboratory skills required for performing a range of chemical and physicochemical analysis of food components

Techniques in Food Analysis

Unit-1: Standard solutions

15 Hrs

Familiarization to terms and calculations used in preparation of various standard solutions.

Unit-2: Instrument Methods of analysis

15 Hrs

Sample and sampling techniques, principles, techniques and applications of colorimetric, spectrophotometer and atomic absorption spectrophotometer, fluorimetry, flame photometry, electrophoresis and different methods of chromatography HPLC, GC, LCMS, ICPMS.

Unit-3: Introduction to animal assay

22 Hrs

Techniques in separation of biomolecular and tracer techniques in biology – radioactivity.

Practical s

1. Handling of equipment and instruments;
2. Preparation of samples,
3. Preparations of solutions and buffers;
4. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of colorimeter,
5. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of spectrophotometer,
6. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of Flame photometry,
7. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of UV spectrophotometer,
8. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of Different methods of chromatography,

9. Quantitative estimation of proximate principles, minerals and vitamins and important cell constituents by use of Techniques in fractionation of proteins.

10. Visit to Food Analysis Laboratories

Learning outcomes

The students will able to

- Describe and use principal analytical methods used for quantifying the composition of food
- Interpret and report data derived from chemical experiments/analysis in a meaningful way
- Learn handling of instruments in analysis of food components

REFERENCES

1. AOAC, 1995, Association of Official Analytical Chemist. Washington, DC. Gruenwedels, D.W. and Whitakor, J.R., 1984, Food Analysis: Principles and Techniques Vols. 1-8.
2. Marcel Dekker., Joslyn, M.A., 1970, Methods in Food Analysis: Physical, Chemical and instrumental methods of analysis.
3. Academic press.
4. Pomeranz, Y. and Molean, C.E., 1997, Food Analysis Theory and Practice. AVI Publ. Sawhney, S.K. and Singh. R., 2000, Introductory Practical Biochemistry. Narosa.

1.1.3

III SEMESTER

FPN – HCT 3.1: CLINICAL NUTRITION

Theory

52 hours

Course Objectives

- To impart understanding of the pathophysiological processes of various organ systems in the body
- To acquaint with the knowledge of clinical parameters for the nutrition management of the diseases
- To provide technical acquaintance for comprehensive nutritional assessment in clinical settings

UNIT I

10 hours

Nutritional screening and assessment of nutritional status of patients. Assessment of patient needs based on interpretation of patient data: clinical, biochemical, biophysical, personal etc.

UNIT II

10 hours

Nutritional support systems

Enteral and parenteral nutrition: Site, Size of the tube, Feed-types, composition, Complications. Recent advances in techniques and feeding substrates. Newer trends in nutritional counselling

UNIT III

16 hours

Medical Nutrition Therapy in the management of

- Stress conditions
- Fever
- Cardiovascular disease
- Gastrointestinal diseases
- Diabetes mellitus
- Renal diseases
- Cancer
- Osteoporosis
- HIV/AIDS

UNIT IV

16 hours

Diet, nutrient and drug interaction: effects of drugs on food intake, nutrient absorption, metabolism and requirement; Effect of food, nutrients and nutritional status on absorption and metabolism of drugs.

Nutrition and immunity: role of individual nutrients in immune response and function.

Practicals

1. Analysis of blood for
 2. glucose
 3. total cholesterol
 4. lipid profile
 5. proteins
 6. minerals
 7. vitamins
 8. alkaline phosphatase
 9. bilirubin
10. Demonstration study of ECG, ECHO, Dialysis

Learning outcomes

After completion of the course, the students will able to

- Collect pertinent information for comprehensive nutrition assessment
- Interpret the clinical parameters for planning the nutritional therapy for medical conditions
- Determine medical nutrition therapy for a various medical conditions
- Use the Nutrition Care Process to make decisions, identify nutrition-related problems and determine and evaluate nutrition interventions.

References

1. Maurice E. Shils, Modern Nutrition in Health and Disease 10th edition
2. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
3. Nutritional biochemistry of vitamins David a bendor.
4. Achayya, K.T., (1998), A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
5. Mahindru, S.N. (2002), Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
6. Present Knowledge in Nutrition – latest edition. International Life Sciences Institute.

FPN – HCT 3.2: PUBLIC HEALTH NUTRITION

Theory

52 hours

Objectives:

- To reduce the incidence of mortality, morbidity, malnutrition and school drop outs
- To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.
- To improve overall nutritional status of the vulnerable group
- To overcome specific nutritional deficiencies among mothers and children
- To help to achieve better nutrition through indirect schemes

UNIT I

8 hours

Scope of community nutrition. Food habits. Economic, social and cultural factors influencing food fallacies and fads. Malnutrition among vulnerable groups. Growth monitoring. Assessment of nutritional status- Direct and indirect methods-anthropometry, dietary, clinical, biochemical and vital statistics. Indicators of Health and Nutrition (ICMR,TMR,MMR)

UNIT II

15 hours

Nutritional problems prevalent in India and measures to combat. National nutrition programmes. Projects related to community nutrition; Government and non-government. Food security – definition, national and household food security, factors affecting food security system. Objectives and functions of national, international agencies and voluntary organizations.

UNIT III

15 hours

Nutritional policy and programs- National nutrition policy-need for nutrition policy, policy strategies-and their implementation. Nutrition programs, National Anemia prevention Prevention of night blindness, National Iodine prophylaxis program. ICDS. National nutrition surveillance system. Food for work etc. NGO in community development operations.

UNIT IV

14 hours

Nutrition intervention Definition, importance, methods of nutrition intervention and their impact evaluation. Nutrition education-Rationale, planning, Execution and evaluation
Food adulteration - adulterants and methods of detection. Food laws in India and consumer protection.

Practicals

1. Study of existing diet and nutritional practices
2. Assessment of nutritional status of an individual/community by using anthropometry and dietary survey.
3. Orientation to a) Preparation of schedule B) Survey work C) Analysis of data D) Writing of report.
4. Visit to local health centre to identify clinical signs and symptoms of nutritional problems.
5. Identification of adulterants in common foods.

6. Visit to an ICDS Block. Development of audio visual aids- radio script; popular article; chart/posters leaflets etc.
7. Study tour to community nutrition related NGO'S and other institutes.
8. Planning, implementation and evaluation of nutrition education for a target group.

Learning outcomes:

- Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of communities.
- Determine and translate nutrient needs into menus for individuals and groups across the lifespan, in diverse cultures and religions, and for different income levels.
- Plan a community intervention based upon a needs assessment
- Advocate for a public policy related to nutrition programs or health care

References:

1. Textbook of Community Nutrition Hardcover – 2007 by Salil & Rita S Raghuvanshi Sehgal (Author)
2. Textbook OF Community Nutrition , Suryatapa Das
3. IGNOU Nutrition For The Community (ANC 1) In English Medium Including Solved Question Papers (Hardbinding, Expert pannel of Neeraj Publication)

1.1.3

IV SEMESTER

FPN – HCT 4.1: DIET DESIGNING IN DISEASES

Theory **52 hours**

Objectives:

To enable the students to:

1. Understand the role of nutrition in good health.
2. Obtain knowledge on different therapeutic diets and their preparation.
3. Develop capacity and aptitude for taking up dietetics as a profession.

UNIT I **15 hours**

Introduction to Diet Therapy

Role of Dietician in the hospital and community. Routine hospital diets: clear liquid diet, soft diet and full fluid diet.

Menu Planning: Rationale for menu planning, Factors affecting food choice, Nutritional factors, other factors. Exchange list vs. food composition tables for menu planning; Steps in the development of exchange list, Diet and dietary patterns;

Modification of diet with respect to nutrients

UNIT II **15 hours**

Modification of diets in relation to: surgical conditions cancer, febrile conditions, gastrointestinal disorders including those of liver and gall bladder, endocrine disorders including diabetes mellitus, hypothyroidism, gout, obesity, cardiovascular diseases, renal disorders, elementary knowledge on diet in rheumatism, arthritis, skin diseases and allergic conditions

UNIT III **12 hours**

Inborn errors of metabolism

Phenyl ketoneuria, Tyrosinemia, Maple syrup urine disease, homocystinuria, Lucine induced hypoglycaemia, galactosemia, hereditary fructose intolerance, Wilson's disease, familial hypercholesterolemia

UNIT IV **10 hours**

Nutrition during environment stress condition

Nutrition during food, famine and drought, high altitudes, for space travel, for heavy manual labourer in tropics, during nutrition emergency and rehabilitation

PRACTICALS **12 practicals per semester**

- Standardisation of weights and measures.
- Standardization of raw weight to cooked weight.
- Planning soft, fluid liquid diets.
- Planning therapeutic diets for the conditions of fever, peptic ulcer, cirrhosis of liver, heart disease, diabetes mellitus, obesity, kidney disease, febrile condition and cancer.

LEARNING OUTCOMES

- Students able to understand principles of diet therapy, modification of normal diet for therapeutic purposes and the role of dietitian.
- Students able to demonstrate counseling techniques to facilitate behaviour change.
- Identify and describe the roles of others with whom the registered dietitian collaborates in the delivery of food and nutrition services.
- Students able to understand the causes, symptoms, risk factors and dietary management of different disease conditions like DM, gall bladder & pancreas, kidney and liver diseases.

Reference books

- Maurice E. Shils, Modern Nutrition in Health and Disease (10th edition)
- Alfred H. Katz, 1999, Prevention and health, the Haworth, Press, New York.
- David a bendor, Nutritional biochemistry of vitamins.
- Achayya, K.T., (1998), A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
- Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
- Present Knowledge in Nutrition, International Life Sciences Institute.
- Swaminathan S., 1985, Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co.
- Robinson., Basic Nutrition and Diet Therapy (8th Edition)
- Robinson, Lawler, 1986, Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co..
- Davis J. and Sherer, K. 1994, Applied Nutrition and Diet Therapy for Nurses, 2nd edition, W.B. Saunders Co.
- Davidson's Human Nutrition – Geissler.
- Jacob Anthikad, Nutrition and Biochemistry for Nurses
- Willims S. R., 1986, Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis.
- Thomas, B., 1996, Manual of Dietetic Practice,.
- L. Matarese Gottschlich, 1998, Contemporary Nutrition Support Practice, Saunders
- ASPEN; Nutrition Support, Dietetics
- F.P Antia and Philip Antia, Clinical dietetics and nutrition.

1.1.3

FPN – SCT 4.4.1: FOOD QUALITY, SAFTY AND CERTIFICATION

Theory

52 hours

Course objectives:

1. To provide fundamental theoretical concepts on food safety systems; technical knowledge for identifying food safety problems and give solutions and to build confidence among the students to handle the food safety projects in food industries industries.
2. More exposure and awareness on food safety systems in Food industries
3. They can easily identify the sources for food standards, regulations and specifications prescribed by different certificate bodies
4. They can implement strong control systems through different techniques

UNIT I

10 Hours

Concept and meaning of Food quality and food Safety, Importance of quality control and assurance, food laws and regulations. National and international food laws, Governing bodies. Application and specifications for food standards, food products, additives, preservatives, colouring agents, emulsifiers, stabilizers and antioxidants, Natural toxins.

UNIT II

15 Hours

Methods/techniques for assessment of quality of different foods. Safety aspects of water and beverages such as soft drinks, tea, coffee, cocoa., Safety assessment of food contaminants and pesticide residues., Safety evaluation of heat treatments and related processing techniques

UNIT III

15 Hours

Hazard analysis and critical control point. Nutritional labeling, bar coding, meaning and importance.

UNIT IV

12 Hours

Food adulteration, detection techniques for processed foods. Municipal health services, mobile units Prevention and control of food, water and air borne diseases.

Practicals

1. PFA, FPO, Agmark, BIS and HACCP for common foods:
2. Cereals and flours, Pulses, nuts and oilseeds, Fruits and vegetables, Oil, butter, ghee, vanaspati and other fats, Milk and milk products, Sugar, jaggery and miscellaneous foods, Meat, fish and poultry, Eggs
3. Physical and chemical methods/techniques for assessment of food quality.
4. Quality evaluation of processed foods with cereal, pulse, vegetable, fruit, milk, milk products, meat, fish and poultry as main component by chemical and sensory methods
5. Market survey of processed foods with reference to food labeling
6. Visit to Consumer Forum/Food Quality Laboratory
7. Food adulteration tests for processed foods

Learning outcome: Students shall

1. Develop a HACCP plans for different food industries
2. Learn HACCP certification
3. Understand laws and regulations governing food safety principles (FSMA, HACCP)
4. Understand industry food safety requirements and certifications: organic, halal, kosher etc.
5. Understand auditing, and different auditing schemes, and be able to complete internal (first party) audits

References

1. Handbook of Analysis and Quality Control for Fruit and Vegetable Products (English, Hardcover, Ranganna S.)
2. Quality Control in the Food Industry, Volume 2 edited by S Herschdoerfer