SAMATA COLLEGE
Affiliated to Andhra University & Approved by AICTE
M.V.P. COLONY, VISAKHAPATNAM - 530 017. (A.P.)

alwar das group since 1979

Dr. G. Srinivasa Rao
M.Sc., MBA, M.Phil., PGDCA, Ph.D.
DIRECTOR

To

Friday, 09 July 2021

The Registrar
Andhra University
Visakhapatnam

Respected Sir,

Sub : Approval of **B.Sc Nutrition & Dietetics Course** Syllabus for the academic year 2020-21: Reg

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We the Samata College would like to bring to your kind notice that, our **B.Sc Nutrition & Dietetics Course Syllabus** **has not been uploaded in the APSCHE web-site**. We would also like to inform you that, ours is the only College running this Course. In this regard, we would like to request your good self to kindly consider and accept the attached syllabus of Nutrition & Dietetics for the academic year **2020-21**.

Thanking you Sir,
Yours faithfully

Dr.G.Srinivasa Rao
Director

Encl : Hard copy of Syllabus and with Soft copy (CD)

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Andhra Pradesh State Council of Higher Education

B.Sc. Nutrition Syllabus under CBCS

w.e.f. 2020-21

Structure of Nutrition Syllabus under CBCS

YEAR	SEMESTER	PAPER	TITLE	MID SEM	END SEM	TOTAL MARKS	CREDITS
I	1	I	Basic Nutrition	25	75	100	03
			Practical – I			50	02
	2	II	Introduction to Food Science	25	75	100	03
			Practical – II			50	02
II	3	III	Family Nutrition	25	75	100	03
			Practical – III			50	02
	4	IV	Community Nutrition	25	75	100	03
			Practical – IV			50	02
	5	V	Diet Therapy-1	25	75	100	03
			Practical – V			50	02
		VI	Quantity Food Production& Service	25	75	100	03
			Practical – VI			50	02
	* Any one Paper from VII A, B & C	VII (A)*	Food Microbiology Hygiene& Sanitation	25	75	100	03
			Practical - VII A			50	02
		VII (B)*	Institutional Food service Management	25	75	100	03
			Practical - VII B			50	02
		VII (C)*	Food Science & Chemistry	25	75	100	03
			Practical - VII C			50	02

Note: One Elective can be opted from 7 (A) (B) (C) Elective Papers.

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III	** Any one cluster from VIII, A, B and C VI	VIII (A)**	**Cluster Electives - I :** VIII-A-1 Applied Life Sciences	25	75	100	03
			Practical			50	02
			VIII-A-2 Diet Therapy	25	75	100	03
			Practical			50	02
			VIII-A-3 Project	Project - 100	Viva -50	150	05
		VIII (B)**	**Cluster Electives - II ::** VIII-B-1 Food Cost and Quality Control	25	75	100	03
			Practical			50	02
			VIII-B-2 Fundamentals of Bakery and Confectionary-1	25	75	100	03
			Practical			50	02
			VIII-B-3 Project	Project - 100	Viva -50	150	05
		VIII (C)**	**Cluster Electives - III ::** VIII-C-1 Maternal&child Nutrition	25	75	100	03
			Practical			50	02
			VIII-C-2 Nutrition Assessment& Surveillance	25	75	100	03
			Practical			50	02
			VIII-C-3 Project	Project - 100	Viva -50	150	05

Note: Cluster: Students can opt any one cluster from among three clusters available.

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FIRST YEAR
PAPER-I Basic Nutrition

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Definition and introduction to nutrition-good nutrition and mal nutrition Macro Nutrients - Classification, digestion, absorption, functions, dietary sources, RDA, clinical manifestations of deficiency and excess and storage in the body of the following in brief: Energy Carbohydrates, lipids and proteins
Unit II	Classification, digestion, absorption, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following in brief: Fat soluble vitamins-A, D, E and K Water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin -C Minerals – calcium, iron, iodine, fluorine and zinc
Unit III	A) Energy value of foods and energy requirement – the body's for energy BMR activities, utilization of food to energy requirements. B)Basal metabolism, factors affecting basal metabolic rate, calorigenic effect of food, specific dynamic action of food. C) Acid base balance.
Unit IV	Importance of water and water balance – functions, sources, requirement – effect of deficiency.
Unit V	A) Interrelation between nutrients – nutrition and health – visible symptoms of good health. B) Nutrition and Infection

PRACTICALS

1. Identification of nutrient rich sources of foods, their seasonal availability and price.
2. Study of nutrition labelling on selected foods.
3. List out low cost nutrient rich foods.
4. List out nutrient foods for different income groups.

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Wardlaw MG, Insel PM (2004). Perspectives in Nutrition, Sixth Edition Mosby
3. Swaminadhan S, Advanced Text book on foods & nutrition, Vol. I&II (2^{nd} revised and enlarge) Rappc. 1985.
4. Vijaya K hader, Food, nutrition & health, Kalyan Publishers, 2000.

FIRST YEAR

PAPER-II Introduction to Food Science

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	A) Foods-Definition and objectives in the study of foods. B) Relation to nutrition and function of foods. C) ICMR food group classification D) Cereals and millets-structure, composition and nutritive value, processing, use in variety of preparations, selections, nutritional aspects and cost.
Unit II	A) Pulses and legumes: Composition and nutritive value, production, selection and variety, storage and processing. B) Vegetables and fruits: Classification, nutritional aspect, pigments present, enzyme browning.
Unit III	A) Milk and Milk products: nutritive value, use in cookery B) Meat, fish, poultry and eggs: nutritive value, use in cookery C) Nuts and oils seeds: nutritive value, use in cookery D) Spices and condiments: nutritive value, use in cookery E) Beverages
Unit IV	A) Food preservation-methods, techniques, principles and their applications-high temperature, low temperature, removal of moisture, irradiation and preservatives. B) Multipurpose foods, dehydrated foods, frozen foods, ready mixers. C) Food spoilage D) Improving nutritional quality of foods: Germination, Fermentation, Supplementation, Substitution, Fortification and enrichment.
Unit V	Food Sanitation and hygiene A) Control and inspection B) Planning and implementation of training program for health personal.

PRACTICALS

1. Standardization of weights and measures of various food items.
2. A)Cereals and pulse preparation.

   B) Vegetable preparation.

   D) Breakfast and snack preparations.

   E) Milk preparation

   F) Soups

   G) Bakery preparation

   H) Beverages

   J) Egg, fish and meat preparations

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Srilakshmi (2010). Food Science, 5th Edition. New Age International Ltd.
3. Wardlaw MG, Insel PM (2004). Perspectives in Nutrition, Sixth Edition, Mosby.

SECOND YEAR
PAPER-III Family Nutrition

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	a. Principles of meal planning – balanced diet, dietary guidelines for Indians, food exchange lists. b. Nutrition in pregnancy – Physiological changes and complications.
Unit II	a. Lactation – Physiology of lactation-nutritional needs, feeding the baby. b. Nutrition during Infancy – Growth and Development – Requirements – Nutrient needs - Breast feeding, weaning – Introduction to Supplementary foods – Feeding pattern. c. Nutrition in preschool age-physiological development and food intake, development of food habits, diet plan.
Unit III	Nutrition of school children and adolescence – Growth and Nutrient needs and requirements – Food choices – Eating habits, Importance of snacks, traditions foods and regional dietary patterns.
Unit IV	Adult – Reference man – Reference women – Nutrient needs and Requirements during various physical activity.(Sedentary, Moderate and Heavy work), diet and life style related diseases and their prevention.
Unit V	Geriatric Nutrition – Factors affecting food intake and nutrient use – Nutrient needs – Nutrition related problems, physiological changes in elderly, nutritional and health concerns in old age and their management.

PRACTICALS

1. Planning and preparation of a balanced diet for pregnant women.

2. Planning and preparation of a balanced diet for a Nursing Mother.

3. Planning and preparation of a balanced diet for a Pre School Child.

4. Planning and preparation of a balanced diet during Adolescence.

5. Planning and preparation of a balanced diet for adult man and women during different physical activities-sedentary, moderate, heavy worker.

6. Planning and preparation of a balanced diet for elderly.

REFERENCES

1. Srilakahsmi, B., Dietetics, New Age International (P) Ltd., 2000.

2. Swaminadhan, M., 1988, Essentials of Food and Nutrition, Volume I and II, The Bangalore Printing and Publishing Co. Ltd., Bangalore.

3. Guthrie Helen A. and Mary Frances Picciano, 1999, Human Nutrition, WCB Mc. GrawHill, Boston.

SECOND YEAR
PAPER-IV Community Nutrition

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Assessment – Nutritional status of the community Anthropometry.
Unit II	Diet surveys and clinical assessment of nutritional status – clinical examination of signs, dietary analysis.
Unit III	a. Biochemical assessment of nutritional status Prevention and cure. b. Indirect methods – vital health statistics. c. Functional foods and its role 1.Phytochemicals, sources, benefits and its function. 2.Food Adultration – Adultration in different foods, their harmful effects, prevention – food adultration act – food standards – ISI, Agmark.
Unit IV	a. National, International programmes related to nutrition a) ICDS – Supplementary feeding programmes – Special nutrition programmes (SNP) – Prophylactic programmes - Vitamin-A, Iron, Iodine etc. b)Role of National and international agencies – WHO, FAO, CARE, UNICEF, ICMR etc. b. Nutrition programmes for improving nutrition and health standards – feeding and nutrition education programmes.
Unit V	Nutritional problems prevalent in India – Under nutrition, Malnutrition and Over nutrition – Deficiency diseases of vitamins and minerals with special reference to protein energy malnutrition, Anaemia, Vitamin-A, Iodine deficiency and B-complex deficiencies – Functional consequences.

PRACTICALS

1. Diet and Nutrition surveys
2. Identifying vulnerable at risk groups
3. Breast feeding and weaning practices of specific groups.
4. Use of Anthropometric measurements in assessing the nutritional status.
5. Observation of mid day programme at Anganwadi Center.
6. Observation and Planning of School Lunch Progrmmes.
7. Planning and preparation of recipes for 15 members or more.

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.

2. Wardlaw MG, Insel PM (2004). Perspectives in Nutrition, Sixth Edition, Mosby

3. Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt Ltd.

4. NIN, ICMR (1990). Nutritive Value of Indian Foods.

5. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation: A Complete Manual, Fourth Edition. Orient Black Swan Ltd.

6. Seth V, Singh K (2005). Diet planning through the Life Cycle: Part 1. Normal Nutrition. A Practical Manual, Fourth edition, Elite Publishing House Pvt Ltd.

7. Srilakahsmi, B., Dietetics, New Age International (P) Ltd., 2000.
Swaminadhan, M., 1988, Essentials of Food and Nutrition, Volume I and II, The Bangalore Printing and Publishing Co. Ltd., Bangalore

THIRD YEAR
PAPER-V Dietary Therapy-I

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Purpose and principles and classification of Therapeutic diets, modifications of normal diet – liquid diet – semi solid diet etc.,
Unit II	Diet in fevers and infections Types, metabolism in fevers, general dietary considerations, diet in influence, typhoid fever, recurrent malaria and Tuberculosis.
Unit III	Diet in GI tract diseases: (a) Diet in gastritis, peptic ulcer (gastric and duodenal). Etiology, symptoms and clinical findings, treatment, dietary principles, and modifications. (b) Diarrhoea (child and adult), classification, modification of diet. * Constipation, dietary considerations * Ulcerative colitis (adult) symptoms * Sprue, dietary treatment
Unit IV	Diet in disease of the liver, gall bladder and pancrease. Etiology, symptoms and dietary treatment in Jaundice, hepatitis, chrholds, of liver and hepatic coma. Dietary treatment in cholystitis and pancreatitis.
Unit V	* Nutrition in injury, burns and surgery. * Diet in allergy and skin disturbances: Definition, classification, manifestations, common food allergies, tests and dietetic treatment. * Nutritional management in cancer.

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PRACTICALS

1. Planning and preparation of diets with modified consistency – liquid, soft diet.
2. Planning and preparation of diets for GI tract diseases – Diarrhoae.
3. Planning and preparation of diets for GI tract diseases – Constipation.
4. Planning and preparation of diets for GI tract diseases – Peptic ulcer.
5. Planning and preparation of diet in fevers and infections.
6. Planning and preparation of diet in Jaundice and Cirrhosis of liver.

REFERENCES

1. Antia, F.P., Clinical Dietetics and Nutrition, 3rd ed. Oxford University Press, Bombay, 1989.
2. Passmore, P. and Eastwood, M.A., Human Nutrition and Dietetics, 8th ed, ELBS, Churchill, Livingstone, 1986.
3. Swaminathan, M., Dietetics, The Bangalore Printing & Publishing Co. Ltd., Bangalore, 1980.
4. Sri Lakshmi, B., 2005, Dietetics, New Age International (P) Ltd., Publishers, New Delhi.

THIRD YEAR

PAPER-VI Quantity Food Production & Service

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Food Service in institutions – General factors to be considered – Kitchen Labout: Size of Kitchen, Types of Kitchen – Hospitals – Institutions.
Unit II	Book – Keeping and Accounting: Book – keeping: System of book keeping : Advantages of the double entry system: Books of account :
Unit III	The types of cash books: Posting of the cast Book: Purchases book: Sales book; Purchases returns book book: Journal, Entries of transactions; maintaining a complete set of of books; restaurant books; trail balance: Profit and loss account.
Unit IV	Equipment for food preparation and service. Classification and selection of equipment. Care and maintenance of equipment.
Unit V	Food cost control: Factors responsible for losses: lack of proper supervision at the point of receiving food from suppliers: Methods of controlling food costs: kitchen calculations and cost statements.

PRACTICALS

1. Planning physical layouts of food service institutions, commercial, non-commercial, school feeding, ICDS etc.,

2. Visits to dietetic departments in hospitals.

3. Quantity Food Production & Purchase and sale by the students.

4. Visit to Mid day Meal Programmes and observation of food service.

5. Visit to a Hospital department (A project report after the field placement)

REFERENCES

1. Mohini Sethi and Surjeet Molhan Catering Management – An Integrated Approach, Wiley Eastern Ltd., 1987.

2. The Complete Book of Cooking Equipment Jules Wilkinson, 2nd edition, A CBI Book, Published by Reinhold Company, 1981.

3. Design and Layout of Food Service Facilities, John C. Birchfield endorsed by the Food Service Consultants Society International 1988 by Van Nostrand Reinhold, 1981

THIRD YEAR

PAPER-VII(a) Food Microbiology Hygiene & Sanitation

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Brief history of food microbiology and introduction to important micro organisms in foods. Primary sources of micro organisms in foods, physical and chemical methods used in the destruction of micro organisms (Sterilisation and Disinfection).
Unit II	**Fundamentals of control of micro organism in foods** Extrinsic and intrinsic parameters affecting growth and survival of microbes, use of high and low temp., dehydration, freezing, freeze-drying, irradiation and preservatives in food preservation.
Unit III	**Food Spoilage** Contamination and micro organisms in the spoilage of different kinds of foods and their prevention. Cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and milk products, canned foods.
Unit IV	**Public health hazards due to contaminated foods** food borne infections and intoxications - symptoms, mode and sources of transmission and methods of prevention. Investigation and detection of food borne disease out-break.
Unit V	Fermented foods and their benefits. Indices of food, milk and water sanitary quality. Microbiological criteria of foods, water and milk testing (Bacteriological analysis)

PRACTICALS

Unit I	Demonstration of the different parts of the microscope, their use and care of the microscope including oil immersion lens.
Unit II	Preparation of bacterial smears, simple staining, differential staining, spore staining, staining of molds and yeasts.
Unit III	Preparation of common laboratory media for cultivation of bacteria, yeast and molds.
Unit IV	Isolation of micro-organisms by pour plate method (Dilution), spread plate and streak plate method.
Unit V	Sampling of air, water, dust, soil, food handlers to study the various sources of transmission of microorganism in foods.

REFERENCES

Frazier, W.C. and Westhoff , D.C. (1988): Fourth Edition, Focd Microbiology, McGraw Hill Inc. Jay James, M. (1986): Third Edition, Modem Food Microbiology, Van Nostrand Reinhold Company inc. Pelezar, M.I. and Reid, R.D. (1978): Microbiology, IYlcGraw Hill Book Company, New York. Benson Harold, J. (1990): Microbiological applications, Wn. C. Brown Publishers, U.S.A. Collins, C.H. and Lyne, P.M. (1976). Microbiological Methods, Buttersworth, London.

THIRD YEAR

PAPER-VII(b) Institutional Food Service Management

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Introduction to Food Service Institutions** Development of Food Service Institutions in India. Characteristics of Food Service Establishments. Effects of environmental changes on different types of establishments.
Unit II	**Food Service Management** – Definitions, principles and functions, Tools of Management, Resources.
Unit III	**Approaches to Management** Traditional management, Systems approach, management by objectives, Total Quality management.
Unit IV	**Management of Resources** Finance, spaces, Equipment and furniture, materials, staff, time and energy, procedures.
Unit V	**Personnel Management** – Definition, development and policies. Recruitment, selection and Induction. Employee benefits. Training and development. Human Relations. Trade Union Negotiation and Settlement.

PRACTICALS

1. Visit to non-commercial food service institution.
2. Visit to commercial food service institution.

REFERENCES

Boella.M.J. (1983): Personnel Management in the Hotel and Catering Industry, 3rd Ed., Hutchinson, London.

Drucker, P.F. (1975): Management, Allied Publishers, New Delhi.

Fearn, D. (1969): Management Systems for the Hotel Catering and Allied Industries.

Hitchcock, M.J. (1980): Food Service Systems Administration, MacMillan, New York.

Koontz, H., O Donnel, C., Weihrich, H. (1983): Essentials of Management, Indian Ed.

Kotas, R. (1972): According in the Hotel and Catering Industry, Intertext Books, 3rd Ed. Butler and Tanner, London.

Moore, C. L. and Jaedicke, R.K.: Management According, South Western Publishing Co.

Sethi, M., Malhan, S. (1993): Catering Management: An integrated approach, Wiley Eastern: New Delhi.

Terry, G.R. (1972): Principles of Management, 6th Ed. Irwin Dorsey Inter-national: London.

West, B.B., Wood, L., Revised by Hargar V.F., Shugart, G.S., Payne-Palacio, J. (1989): Food Service in Institutions, 6th Ed., MacMillan Publishing Co., New York.

THIRD YEAR
PAPER-VII(c) Food Science & Chemistry

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Carbohydrates** Classes, type, structure and food sources. Chemical reactions in foods – hydrolysis, thermal degradation, dehydration, caramelization, Maillard Reaction, Structure function relations of carbohydrates. Applications in food industry. **Cereals and Cereal Products:** Types of Cereals, Composition and Structure of cereal grains. Starch – types and structure(Modified and Unmodified) . Functional properties of starch. Gelatinization factors affecting gelatinization. Criteria for selecting a starch.
Unit II	**Lipids (Fats and Oils)** Classification, Source of chemistry lipids- physical properties and chemical reaction in foods. Steps in manufacture of food fats, Role of fat and applications in food preparation. Shortenings- shortening value and factors affecting it. Selection of fats and oils, Fat substitutes. Deterioration of fats/oils – rancidity, reversion and polymerization.
Unit III	**Proteins** Composition, types and physiochemical properties of amino acids and proteins. Hydrolysis. Denaturation of proteins. Functional properties of proteins - hydration, solubility, viscosity, gelation, texturization, emulsification, binding, foaming, Maillard reaction and Browning.
Unit IV	**Milk and Milk Products** Composition of milk, milk products and processes used for production (in brief). Uses in cookery, effect of heat, enzymes, acid and salts on milk and milk products.
Unit V	**Eggs** Structure, composition and quality of eggs. Functional properties and uses in cooking. Foams - (Yolk, White) and uses/applications.

PRACTICALS

Unit I	**Water** Boiling point, freezing point, influence of solutes, water activity and perishability of foods.
Unit II	**Carbohydrates** Monosaccharides and Disaccharides- qualitative test for identification. Estimation of Reducing Sugars.
Unit III	**Proteins, Peptides and amino acids** Qualitative tests for identification, quantitative estimation of Nitrogen by Kjeldahl method.
Unit IV	**Lipids** Estimation of fat content in milk (Gerber's) and other foods (Soxhlet). Estimation of free fatty acids (acid values in fats). Estimation of rancidity. Estimation of Iodine value.
Unit V	**Egg Cookery- changes in egg with storage and deterioration** Preferred methods for cooking eggs in the shell. Relationship of time and temperature in denaturation of egg proteins, effect of salt, acid, dilution (Conc. of proteins, sugar, freezing). Functional role of egg in cookery, Egg white foams - factors contributing to volume and stability of egg white foams.

REFERENCES

Baianu, I.C. (Editor): Physical Chemistry of Food Processes, Vol. 1. Fundamental Aspects, AVI Books, New York. Fennema, O.R. (Editor) (1985): Food Chemistry, 2nd edition. Marcel Dekker inc., New York.

Wong, D.W.S. (1989): Mechanism and Theory in Food Chemistry, AVI Books. Van Nostrand Reinhold, New York. Ronsivalli, L.J. and Vieira, E.R. (1992): Elementary Food Science, 3 d ed. Chapman & Hall, New York.

Mc Williams, M. (1989): Food: Experimental Perspectives, 2nd ed., MacMillian Publishing Co.

Charley, H. (1982): Food science, 2nd ed., John Wiley & sons.

MacMilliams, M.(1984): Experimental foods laboratory manual, Surjeet publications.

Potter,N.N., Hotchkiss J.H. (1996): Food science, 5th ed., CBS Publishers and distributors, Delhi.

THIRD YEAR
PAPER-VIII(A)(I) Applied Life Sciences

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**General principles of physiology.** Cardiovascular System. Structure and functions of heart. Heart rate, Cardiac output, blood pressure and its regulation. Circulation of blood.
Unit II	**Gastrointestinal System**: Structure and functions of various organs of the GI Tract. Digestion and absorption of food and the role of enzymes and hormones.
Unit III	**Excretory System**: Structure and functions of Kidney, bladder, formation of urine, role of kidney in homeostasis. Structure and function of skin. Regulation of temperature of the body.
Unit IV	**Respiratory System**: Structure of lungs. Mechanism of respiration and its regulations. O2 and CO2 transport in blood. Vital capacity and other volumes. Muscular exercise.
Unit V	**Musculoskeletal System**: Types of muscles, functions. Skeleton system – formation of bone and teeth.

REFERENCES

1. Guyton, A.C., Hall, J.E.(1996): Textbook of Medical Physiology, 9th Ed., Prism Books (Pvt.) Ltd., Bangalore.
2. Winwood(1988): Sear's Anatomy and Physiology for nurses, London, Edward Arnold.
3. Wilson (1989): Anatomy and Physiology in health and illness, Edinburgh, Churchill Livingstone.
4. Chatterjee Chandi Charan (1988): Textbook of Medical physiology, London, W.B.
5. Saunder's Co. Verma, V.(1986): A textbook of Practical Botany, Vol. I to IV, Rastogi Publication.
6. Anderson, D.B. and Mayer, B.S. (1970): Plant physiology, Van Nostrand Reinhold Company, East West Press Edition.
7. Kochhar, P.L. (1994): A textbook of plant physiology, Atma Ram & Sons, Delhi.
8. Dhami, P.S. (1987): A Textbook of Zoology, S.Nagin & Company, Jullundhar.
9. K.S.Gopalaswamy Iyengar(1991): Complete Gardening in India, Bangalore, Gopalaswamy Parthasarthy.
10. Kochar, S.L. (1981): Economic Botany in tropics, MacMillan, India.
11. Hartmann, H. and Kester, D.E.(1993): Plant Propagation principles and Practice, New Delhi. Prentice Hall of India (Pvt.) Ltd.

THIRD YEAR
PAPER-VIII(A)(II) Diet Therapy II

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Diet in disease of the endocrine pancreas – Diabetes Mellitus-** Classification, symptoms, diagnosis, management of diabetes mellitus-clinical vs. chemical control. Insulin therapy. Dietary care and nutritional therapy, meal plan (with and without insulin). Special dietetic foods, Sweeteners and sugar substitutes. Diabetes in pregnancy, Diabetic coma, Juvenile Diabetes.
Unit II	**Diseases of the cardiovascular system-** Atherosclerosis: Etiology and risk factors. Hyperlipidemias: Brief review of Lipoproteins and their metabolism, classification of Hyperlipidemias. Clinical and nutritional aspects of hyperlipidemias. Dietary care. Ischemic Heart Disease – nutritional management. Congestive heart disease and nutritional management. Hypertension – etiology, prevalence, nutritional management and prevention. Cerebrovascular disease and diet.
Unit III	**Renal diseases- Review of physiology and function of normal kidney** Diseases of kidney – classification, etiology, characteristic symptoms and dietary management in: Glomerulonephritis – acute and chronic, Nephrotic syndrome, renal failure and uremia, acute and chronic renal failure.
Unit IV	**Diseases of Musculoskeletal System** Dietary management of rheumatoid arthritis, osteoarthritis, osteoporosis. Cancer – Nutritional and non- Nutritional etiological factors: Management of cancer patients in relation to the clinical treatment and cachexia. Surgery, trauma and burns – Physiological changes in relation to trauma. Assessment of the nutritional status in surgical and burns patients: Pre-operative and post-operative nutritional care. Nutritional care in trauma. Nutritional management of burns patients.
Unit V	**Interactions between drugs, nutrients.** Inborn errors of metabolism – Biochemical basis and nutritional management of PKU and Maple Syrup Urine Disease.

PRACTICALS

Unit I	**High-Risk Management (hospital based) – Nutrition assessment** Management of patients with feeding problems. Tube feeds – all forms, elemental and parenteral.
Unit II	**Diabetes Mellitus-** Planning and preparation of diets. Without insulin, with insulin, adult and juvenile, diabetes in pregnancy, diabetes and illness.
Unit III	**Diseases of cardiovascular system-** Formulation of low cholesterol and low sodium recipes, planning and preparation of diets for hypertension, CHD, congestive heart failure.
Unit IV	**Protein and mineral modifications for patients with renal disease-** Planning and preparation of diet for glomerulonephritis – acute and chronic, nephritic syndrome, nephrolithiasis, renal failure – acute and chronic, dialysis.
Unit V	**Low purine diet.**

REFERENCES

Anderson, L., Dibble, M.V., Turkki, P.R., Mitchell, H.S. and Rynbergin, H.J. (1982) :Nutrition in health and Disease, 17th Ed., J.B. Lippincott & Co. Philadelphia.

Antia, F.P. (1973): Clinical Dietetics and nutrition, 2nd Ed., Oxford University Press,Delhi.

Mahan, L.K., Arlin, M.T. (1992): Krause's Food, Nutrition and Diet Therapy, 8th Ed., W.B. Saunders Company, London.

Robinson, C.H., Lawler, M.R., Chenoweth, W.L., and Garwick, A.E. (1986): Normal and Therapeutic Nutrition. 17th Ed., MacMillan Publishing Co.

Williams, S.R.(1989): Nutrition and Diet therapy, 6th Ed., Times Mirror/Mosby College Publishing, St.Louis.

Raheena, Begum (1989): A textbook of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi.

Joshi, S.A. (1992): Nutrition and Dietetics, Tata McGraw Hill Publications, New Delhi.

THIRD YEAR
PAPER-VIII(A) Project

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Meaning of scientific research and its methods. Formulation of project design
Unit II	Types of project design – exploratory, descriptive, experimental, cross sectional or longitudinal.
Unit III	Methods- survey, case study, anthropological or experimental.
Unit IV	Tools and Techniques- observation, interviewing, questionnaire schedules or rating scales.
Unit V	Tabulation and Interpretations – Elementary statistical procedure. Tabulation and graphic representation of data and its interpretations.

INTERNSHIP

Unit-I: Placement in hospital dietary departments and diet clinics to gain knowledge to

- Establish rapport with patients- assess the nutritional status and diet history of patients.
- Plan diet sheets after careful study of the patients case sheets – prepare and provide guidance in the production of therapeutic diets.
- Supervise preparation of diets – assist and guide in tray setting with special emphasis on portion control and therapeutic modifications.
- Supervise delivery of trays to the patients.
- Get feedback from patients regarding diets.
- Discuss/consult with doctors for modifications.

-Undertake case study at hospital situations.

-Visits to different dietary departments of various hospitals.

-Updating knowledge by presentations and participation through seminars and projects.

-Gain experience in the administrative set up of a dietary department.

Unit-II: Project formulation – setting the objectives, steps in execution.

THIRD YEAR

PAPER-VIII(B)(I) Food Cost and Quality Control

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Importance of costing and cost control, methods of costing and costing** Methodology in catering business, emphasis on batch costing.
Unit II	**Cost classification into materials, labour and overheads and their** Percentage analysis on net sales for clear understanding of their relative importance.
Unit III	**Material costing, use of standardized recipes, materials cost control** Through basic operating activities like purchasing, receiving, storage, issuing, production, sales and accounting; yield analysis from time to time.
Unit IV	**Materials costing as an aid to pricing by a suitable mark up policy Control of labour costs and overheads, periodical** Percentage analysis, calculation of overhead allocation rates.
Unit V	**Cost behavior into variable, fixed and semivariable and its impact on unit cost Cost reporting system – daily, monthly and for special managerial decisions.**

PRACTICALS

Unit-I: Cost control- Developing IC/C Procedures for materials –

- Purchasing, receiving, storing, issuing. Developing IC/C procedures for food and beverage department.
- Developing IC/C procedure for front office. Developing IC/C procedure for housekeeping.

Unit-II: Quality control – Analysis and detection of adulterants in foods.

- Oils, fats(Chemical and microbiological estimations). Butter and Ghee. Cereal grains, flours and cereal products. Milk and milk products. Ice cream, Cakes and Biscuits. Confectionery, Species.

Unit-III: Detection of food additives – preservatives, colours, antioxidants, pesticides, flavours.

Unit-IV: Shelf life studies (to be spread over a few weeks).
Unit-V: Tests used for Wrapping and packaging materials

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THIRD YEAR

PAPER-VIII(B)(II) Fundamentals of Bakery and Confectionary I

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	Introduction to bakery and confectionary – aims and objectives, historical perspective.
Unit II	Wheat flour and its role in bakery and confectionary products- • Wheat-type, grading, varieties, structure, composition, principles of flour milling, air classification. • Flour-Types of flour (bakers, biscuits, cake, pastry, self mixing flour, whole wheat flour) – Composition, role of constituents, quality assessment.
Unit III	Other ingredients and their function in baking • Yeast – types, function, uses, effects of over and under fermentation. - Eggs – Composition, function in bakery and confectionary. - Sugar – types, different forms uses. - Fats – composition, classification, function, effect of cooking. • Milk products, emulsifiers, dried fruits, enzymes, cream, and other leavening agents.
Unit IV	Variety of baked products – bread, biscuit, cake, cookies, pastries.
Unit V	Baking process-basic concepts, batch/continuous, dough mixing, dividing, molding, panning, proofing, baking.

PRACTICALS

Unit 1: Evaluation of flour quality - moisture, ash, gluten, water absorption, maltose value, dough raising capacity, test baking.

Unit 2: Evaluation of bakery ingredients other than flour - fats, sugar, salt, liquid leavening agents.

Unit 3: Weights and measures – quantity and volume equivalence of house hold measures.

Unit 4: Preparation of bread using straight dough and sponge dough methods- quality characteristics.

Unit 5: Breads of varying Processing conditions and ingredients – quality characteristics.

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THIRD YEAR
PAPER-VIII(B) Project

Theory: 4Hrs/Week
Practical: 3Hrs/Week

INTERNSHIP – ASPECTS TO BE COVERED

1. Visit to different types of catering institutions.
2. Market survey to study the availability and cost of equipment.
3. Meal planning and costing menus in institutional food service management.
4. Quantity production of cereals, pulses, vegetables, milk, fruits, and fleshy foods and their quality assurance.
5. Practical experience in layout planning, work simplification methods, time and motion study.
6. Project based on: Fuel economy, waste disposal.

THIRD YEAR

PAPER-VIII(C)(I) Maternal and Child Nutrition

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Nutrition during Pregnancy** Physiology of pregnancy, factors (non-nutritional) affecting pregnancy outcome, important of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements during pregnancy and modification of existing diet and supplementation, nutritional factors affecting breast – feeding. Deficiency of nutrients and impact – energy iron, folic acid, protein, calcium, iodine. Common problems of pregnancy and their management – nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.
Unit II	**Nutrition during lactation – physiology of lactation** Nutritional requirements during lactation and dietary management, food supplements, Galactogogues, preparation for lactation. Care and preparation of nipples during breast hygiene.
Unit III	**Nutrition during infancy** Infant physiology relevant to feeding and care. Breast feeding – Colostrums, its composition and important in feeding. Initiation of breast feeding and duration of breast feeding. Advantages of exclusive breast feeding. Nutritional and other advantages of breast feeding. Introduction of complementary foods, initiation and management of weaning, breast feeding etc. Bottle feeding – circumstances under which bottle feeding is to be given. Care and sterilization of bottles. Preparation of formula. Mixed feeding – breast and artificial feeding. Teething and management of problems.
Unit IV	**Growth and development from infants and children** Somatic, physical, brain and mental development, puberty, menarche, prepubertal and pubertal changes. Importance of nutrition for ensuring adequate growth and development.
Unit V	**Management of preterm and low birth weight children** **Feeding children with special needs.** **Dietary management of children during diarrhea and fever** Use of ORT and prevention of dehydration, home based fluids.

PRACTICALS

Unit-I: Visit to antenatal clinic and counseling mothers at ANC.
Unit-II: Planning and preparation of dietary schedule for infants.
Unit-III: Use of amylase rich foods in diets of infants and toddlers.
Unit-IV: Preparation of nutritious snacks for children, rich in energy, protein and important micro-nutrients.
Unit-V: Preparation of various recipes for use in diarrhea.

REFERENCES

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THIRD YEAR

PAPER-VIII(C)(II) Nutritional Assessment and Surveillence

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Nutritional status assessment and surveillance** Meaning, need, objectives and importance.
Unit II	**Direct nutritional assessment of human groups** Clinical signs, Nutritional anthropometry, biochemical tests, biophysical methods.
Unit III	**Diet surveys** Need and importance, methods of dietary survey. Interpretation – concept of consumption unit, intra and inter individual distribution in family. Adequacy of diet with respect to RDA, concept of family food security.
Unit IV	**Clinical signs** Need and importance, identifying signs of PEM, vitamin A deficiency and iodine deficiency. Interpretation of descriptive list of clinical signs.
Unit V	**Nutritional anthropometry** Need and importance, standards for references, techniques of measuring height, weight, head, chest and arm circumstance, interpretation of these measurements and use of growth charts.

PRACTICALS

Unit-I: Anthropometry

Measurement of infant length, height, weight, circumference measurements, head, chest. Mid-upper arm, waist, hip, precautions to be taken, Accuracy, precision and reliability of measurements. Intra and inter observer variability and errors. Tools used and sensitivity.

Unit-II: Comparison with norms and Interpretation to assess nutritional

- Status(weight for age, height for age, weight for height, MUAC,
- Z-scores, standard deviation, BMI, waist to hip ratio) and significance.

Unit-III: Tests for body composition – Methods in brief and significance. Measurement of fat using skin fold thickness.

Unit-IV: Growth charts – plotting of growth charts. Growth monitoring and promotion.

Unit-V: Clinical assessment and signs of nutrient deficiency for the following – PEM (Kwashiorkor, Marasmus), Vitamin A, Anaemia, Rickets, B- Complex deficiencies.

REFERENCES

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THIRD YEAR
PAPER-VIII(C) Project

Theory: 4Hrs/Week
Practical: 3Hrs/Week

THEORY:

Unit I	**Meaning of scientific research and its methods** Formulation of project design.
Unit II	**Types of project design** Exploratory, descriptive, experimental, cross- sectional or longitudinal.
Unit III	**Methods** Survey, case study, anthropological or experimental.
Unit IV	**Tools and techniques** Observation, interviewing, questionnaire schedules or rating scales.
Unit V	**Tabulation and interpretations** Elementary statistical procedures, tabular and graphic representation of data and its interpretation.

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