Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
(Reaccredited with 'A' grade by NAAC)
Autonomous College - Affiliated to Osmania University

Department of Biochemistry & Nutrition

Template for B.Sc. BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY (BCNDC)

Under Choice Based Credit System (CBCS)

(Batch 2022-23 to 2024-25)

FIRST YEAR – SEMESTER-I				
Course Code	**Course title**	**Course Type**	**HPW**	**CREDITS**
	Environmental Science/Computer Skills	AECC-1	2	2
	English	CC-1A	4	4
	Second Language	CC-2A	4	4
	Optional 1	DSC-1A	4T+3P=7	4+1=5
ND136	**Introduction to Foods & Nutrition**	**DSC-2A**	**4T+3P=7**	**4+1=5**
	Optional 3	DSC-3A	4T+3P=7	4+1=5
	TOTAL		**31**	**25**
SEMESTER-II				
	Environmental Science/Computer Skills	AECC-2	2	2
	English	CC-1B	4	4
	Second Language	CC-2B	4	4
	Optional 1	DSC-1B	4T+3P=7	4+1=5
ND236	**Nutritional Biochemistry And Human Physiology**	**DSC-2B**	**4T+3P=7**	**4+1=5**
	Optional 3	DSC-3B	4T+3P=7	4+1=5
	TOTAL		**31**	**25**
SECOND YEAR –SEMESTER-III				
	English	CC-1C	3	3
	Second Language	CC-2C	3	3
	Optional 1	DSC-1C	4T+3P=7	4+1=5
ND336	**Normal and Therapeutic Nutrition**	**DSC-2C**	**4T+3P=7**	**4+1=5**
	Optional 3	DSC-3C	4T+3P=7	4+1=5
	Communication Skills	SEC-1	2	2
SE336	**Nutraceuticals, Functional & Novel foods**	**SEC-2**	**2**	**2**
	TOTAL		**31**	**25**

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SEMESTER-IV				
	English	CC-1D	3	3
	Second Language	CC-2D	3	3
	Optional 1	DSC-1D	4T+3P=7	4+1=5
ND436	**Diet in Disease**	**DSC-2D**	**4T+3P=7**	**4+1=5**
	Optional 3	DSC-3D	4T+3P=7	4+1=5
	Universal Human Value	SEC-1	2	2
SE436	**Strategies for weight management**	**SEC-4**	**2**	**2**
	TOTAL		**31**	**25**
THIRD YEAR –SEMESTER-V				
	English	CC-1E	3	3
	Second Language	CC-2E	3	3
	Optional 1	DSE-1E	4T+3P=7	4+1=5
ND536/ ND536A	**Clinical Dietetics/ Diet Therapy**	**DSE-2E**	**4T+3P=7**	**4+1=5**
	Optional 3	DSE-3E	4T+3P=7	4+1=5
GE536	**Nutrition and Health**	**GE**	**4T**	**4**
	TOTAL		**31**	**25**
SEMESTER-VI				
	English	CC-1F	3	3
	Second Language	CC-2F	3	3
	Optional 1	DSE-1F	4T+3P=7	4+1=5
ND636/ ND636A	**Public Health Nutrition/ Community Nutrition**	**DSE-2F**	**4T+3P=7**	**4+1=5**
	Optional 3	DSE-3F	4T+3P=7	4+1=5
ND636_O ND636_PW	**Optional Paper Theory – Food Sanitation and Hygiene / Project work**		**4**	**4**
	TOTAL		**31**	**25**
	TOTAL CREDITS			**150**

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PROGRAM NAME: B.Sc. (MICROBIOLOGY, NUTRITION & DIETETICS, CHEMISTRY- MBNDC)
(w.e.f 2022-23)

COURSE NAME: INTRODUCTION TO FOODS & NUTRITION

PAPER CODE: ND136 | **PPW: 4**
YEAR/SEMESTER: I/I | **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize the students with various food groups and their nutritive value and to learn about food preservation and adulteration.

UNIT-WISE COURSE OBJECTIVES:

COb1 To describe the balanced diet and different food groups with their nutritive values.
COb2 To explain the composition and nutritive value of pulses, cereals, legumes and fats.
COb3 To discuss the nutritive value of vegetables and fruits and methods of food preservation.
COb4 To explain the nutritive value of animal foods and food adulteration.

UNIT I: INTRODUCTION TO FOOD GROUPS, CEREALS & MILLETS & PURE CARBOHYDRATES **15 hours**

1. Definition- Food, nutrition, nutrients; food groups based on functions, origin and nutritive value. Food guide pyramid, balanced diet.
2. Cereals and Millets - Composition, nutritive value and nutrient losses during processing; breakfast cereals
3. Sugars - Types of sugars and stages of sugar cookery
4. Jaggery - Manufacture and stages of jaggery cookery

UNIT II: PULSES & LEGUMES, NUTS & OIL SEEDS AND FATS & OILS 15 hours

1. Pulses & Legumes - Composition, nutritive value, nutrient losses during processing, importance of germination and malting; anti nutritional factors
2. Nuts & Oilseeds – Nutritive value, toxins and role in cookery
3. Fats & Oils – Composition, nutritive value, properties- physical and chemical, functions of oils and fat in foods
4. Rancidity of Oils- Types and prevention

A. Lai Das 28/5/22

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UNIT III: VEGETABLES, FRUITS & FOOD PRESERVATION **15 hours**

1. Vegetables - Classification, composition and nutritive value, changes during cooking, loss of nutrients during cooking, storage, factors affecting storage.
2. Fruits - Classification, composition, nutritive value, storage and ripening.
3. Enzymatic browning and its prevention.
4. Food preservation – principles, traditional methods- curing, freezing, canning, boiling, pickling; modern techniques- pasteurization, freeze drying, vaccum packing, irradiation, pascalization. Bio preservatives and chemical preservatives.

UNIT IV:ANIMAL FOODS AND FOOD ADULTERATION **15 hours**

1. Milk- Composition, nutritive value, fermented and non-fermented milk products
2. Egg - Composition, nutritive value and quality; poultry- Classification, composition and nutritive value
3. Meat -Nutritive Value and changes during cooking; fish - classification, composition and nutritive value
4. Food Adulteration- intentional and incidental

REFERENCES:

1. Srilakshmi B- Food Science, 5th Edition, New Age International Publishers, New Delhi – 110002, 2011.
2. ShakuntalaManay N - Food Facts and Principles, New Age International Publishers, New Delhi – 110002, 2005.
3. Norman Potter N -Food Science, CBS Publishers and Distributors, Newϖ Delhi – 110002, 2007.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND136.CO1 Elaborate various food groups and importance of balanced diet.
ND136.CO2 Formulate the diet based on composition and nutritive value of pulses, legumes and fats.
ND136.CO3 Select types of vegetables and fruits for healthy diet and apply the methods of food preservation in food industry.
ND136.CO4 Compare the nutritive values of milk, egg and meat and discuss about food adulterants.

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(w.e.f 2022-23)

COURSE NAME: INTRODUCTION TO FOODS AND NUTRITION

PAPER CODE: ND136P **PPW: 3**
YEAR/SEMESTER: I/I **NO.OFCREDITS: 1**

COURSE OBJECTIVE:
COb1 To describe standardization of recipes and nutritive calculations.
COb2 To explain food preservation methods and detection of food adulterants.

I. Standardization, Preparation and Nutritive value calculation of the recipes based on the following food group and combination.
1. Cereal, millet and malting of grains
2. Pulse, germination of grains.
3. Cereal-pulse combination
4. Stages of sugar cookery, preparation with jaggery

II. Methods of Preservation of
5. Fruits- Squashes and jams
6. Vegetables by Pickling

III. 7. Determination of quality of an egg

IV. Detection of Adulterants
8. Water, urea and starch in milk
9. Hydrogenated fat in ghee and butter
10. Identification of food colours and textile colours

REFERENCES:

1. Srilakshmi B- Food Science, 5th Edition, New Age International Publishers, New Delhi – 110002, 2011.
2. LongvahT. ,Ananthan R. , Bhaskarachary K. and Venkaiah K. Indian Food Composition Table, NIN

COURSE OUTCOMES:
At the end of the course students will be able to:

ND136P.CO1 Comparethe nutritive values of various food groups and standardize the recipes.
ND136P.CO2 Implement food preservation methods and identify food adulterants.

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(w.e.f 2022-23)

COURSE NAME: NUTRITIONAL BIOCHEMISTRY AND HUMAN PHYSIOLOGY

PAPER CODE: ND236 **PPW: 4**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize the students with role of micronutrients and macronutrients in the body and to understand the role of different organ systems.

UNIT-WISE COURSE OBJECTIVES:

COb1 To explain the structural and functional importance of macronutrients.
COb2 To compare the significance, functions and deficiencies of micronutrients.
COb3 To explain the significance of water, its components, enzymes and hormones.
COb4 To discuss the cell structure, immunity, blood and its components, respiratory, nervous system and skin.

UNIT 1: MACRONUTRIENTS — 15 hours

1. Carbohydrates - Composition, classification, sources, functions, deficiency and excess, glycolysis, citric acid cycle, and gluconeogenesis,
2. Lipids - Composition, classification, sources and functions; deficiency and excess of fats, essential fatty acids, beta-oxidation.
3. Amino acids- Classification - Chemical and nutritional; deamination, transamination, decarboxylation and amino acid pool, supplementary value of aminoacids.
4. Proteins- Composition, classification, sources, functions, biological value of proteins, deficiency and excess, basic steps in protein synthesis.

UNIT II: MICRONUTRIENTS — 15 hours

1. Vitamins- Introduction, Classification, fat soluble vitamins A, D, E, K – chemistry, sources, functions, deficiency symptoms, RDA.
2. Water soluble vitamins – (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid, cyanocobalamine, and ascorbic acid) chemistry, sources, functions, deficiency symptoms, RDA.

3. Minerals-Classification, sources, functions and deficiency symptoms of macrominerals (calcium, phosphorus, sodium, potassium and chlorine).
4. Microminerals: Sources, functions and deficiency symptoms (iron, iodine, fluorine, zinc, selenium)

UNIT III: WATER, ELECTROLYTES, ENZYMES AND HORMONES 15 hours

1. Water - Functions, distribution, intake and elimination, water balance
2. Electrolytes - Concentrations in intracellular and extra cellular fluids and osmotic pressure; acid base balance.
3. Enzymes - Definition, classification (IUBMB), properties, mechanism of enzyme action, inhibitors of enzyme action.
4. Hormones- Endocrine glands their secretion and functions, classification of hormones.

UNIT IV: CELL, IMMUNE SYSTEM, BLOOD, RESPIRATORY SYSTEM, NERVOUS SYSTEM AND SKIN 15 hours

1. Cell- Structure & functions, Overview of the Immune system and key features of the immune response.
2. Blood- Composition, coagulation and blood groups.
3. Respiratory system- Parts and functions, mechanism of respiration; oxygen and carbon dioxide transport
4. Nervous system – Classification and functions.
5. Skin: functions and its role in the regulation of body temperature.

REFERENCES:

1. Ferrier, D.R., Lippincott's Illustrated Reviews: Biochemistry, 5th or 6th Edition, Lippincott Williams & Wilkins, Baltimore,
2. Chatterjee C.C., Human Physiology, Vol. I & II, Medical Allied Agency, Calcutta (1987). AVSS Rama Rao - A Text Book of Bio Chemistry, 9th edition, UBS Publishers distribution Pvt.Ltd, 2002.
3. Swaminathan N - A Handbook of Food and Nutrition, 5th edition volume 1, Bangalore printing and publishing Co.Ltd, 1986.
4. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd 2004.
5. Swaminathan M, Advanced Textbook on Food and Nutrition, Vol. I, Bappco.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND236.CO1 Interpret the significance of relation between macronutrient metabolism and health.
ND236.CO2 Choose various sources of vitamins and minerals in planning healthy diet menu.
ND236.CO3 Compile the importance of water, electrolytes, enzymes and hormones.
ND236.CO4 Relatethe various organ systems and their functions.

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PROGRAM NAME: B.Sc. (MICROBIOLOGY, NUTRITION & DIETETICS, CHEMISTRY-MBNDC)
(w.e.f 2022-23)

COURSE NAME: NUTRITIONAL BIOCHEMISTRY AND HUMAN PHYSIOLOGY

COURSE OBJECTIVE:

COb1 To describe methods of analysis for biomolecules and other nutrients.
COb2 To explain quantitative analysis of clinical parameters in blood.

PAPER CODE: ND236P **PPW: 3**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 1**

1. Qualitative tests of carbohydrates.
2. Qualitative tests of amino acids and proteins.
3. Quantitative analysis of calcium by titrimetry.
4. Quantitative analysis of vitamin C 2,6dichlorophenolindophenol dye method.
5. Determination of rancidity parameter: Acid value.
6. Determination of rancidity parameter: Peroxide value.
7. Estimation of haemoglobin.
8. Estimation of blood glucose.
9. Identification of blood group.

REFERENCES

1.Raghuramulu, Madhavannair, Kalyansundram, A manual of laboratory techniques, NIN. Hyderabad (2003).
2.Sawhney SK, Randhir Singh, Introductory practical biochemistry, Nasora Publishers, New Delhi (2000).

COURSE OUTCOMES:

At the end of the course students will be able to:

ND236P.CO1 Identify and differentiate the biomolecules and nutrients in food samples.
ND236P.CO1 Analyze the changes in clinical parameters in health and disease.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2023-24)

COURSE NAME: NORMAL AND THERAPEUTIC NUTRITION (THEORY)

PAPER CODE: ND336 **PPW: 4**
YEAR/SEMESTER: II/III **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize students with RDA, meal planning and their changes during the life cycle and diseases.

UNIT-WISE COURSE OBJECTIVES:

COb1 To describe about meal planning and nutritional requirements in various physiological states.
COb2 To explain nutritional requirements in different stages of life.
COb3 To explain therapeutic nutrition in diseases.
COb4 To discuss the diet management in various inborn errors of metabolism and food allergies.

UNIT I: MEAL PLANNING **15 hours**

1. RDA- factors affecting RDA, derivation; Principles of meal planning; Steps involved in planning a meal
2. Adulthood – Nutritional Requirements for an Adult Man and Adult Woman
3. Pregnancy – Physiological Changes, Increase in Nutritional Requirement Complications of Pregnancy
4. Lactation – Role of hormones in milk production, Increase in Nutritional Requirement and Lactogogues

UNIT II: NUTRITION THROUGH LIFE CYCLE **15 hours**

1. Infancy – Nutritional Requirement, Importance of Breastfeeding, Artificial Feeding (Comparison of various milks Vs Human Milk), Weaning and Supplementary Food
2. Pre-Schoolers and School Going Child – Nutritional Requirement and School Lunch Programmes, Growth charts
3. Adolescence – Nutritional Requirement, Eating Disorders
4. Geriatrics – Nutritional Requirement, Physiological changes and Dietary Modification

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UNIT III: INTRODUCTION TO THERAPEUTIC NUTRITION 15 hours

1. Introduction to therapeutic nutrition, therapeutic modifications of normal diets in terms of Nutrients, Consistency. MNT and Role of dietician.
2. Fevers-Definition, Causes (Exogenous and Endogenous), Types – Typhoid Causative organism, Symptoms, Principles of the Diet, Dietary Modifications, Foods to Be included and Foods to Be Avoided
3. Tuberculosis - Causative Organism, Symptoms, Principles of the Diet, Dietary Modifications, Foods to be Included and Foods to be avoided
4. AIDS –Symptoms and dietary management.

UNIT IV: DIET IN GENETIC DISORDERS AND FOOD ALLERGY 15 hours

1. Inborn Errors of Metabolism; Phenylketonuria – Definition, symptoms, Dietary Management.
2. Galactosemia - Definition, symptoms, Dietary management
3. Lactose Intolerance- Definition, symptoms, Dietary management
4. Food Allergy and Food Intolerance –Definition, Clinical Signs and Symptoms, difference between food allergy and intolerance, Food and drug interaction.

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND336.CO1 Develop a meal plan to meet the requirements of various physiological states.
ND336.CO2 Differentiate the importance of nutritional requirements in different stages of life.
ND336.CO3 Relate the diet modifications to various diseases.
ND336.CO4 Plan suitable diet for inborn errors of metabolism, food allergies, intolerance and food drug interaction.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2023-24)

COURSE NAME: NORMAL AND THERAPEUTIC NUTRITION

PAPER CODE: ND336P **PPW: 3**
YEAR/SEMESTER: II/III **NO. OF CREDITS: 1**

COURSE OBJECTIVE:
COb1 To familiarize the students with planning, calculation and preparation of diets for various physiological states.
COb2 To train the students in planning and preparing diets in diseases.

1. Standardization of Weights and Measures.
2. Planning, Calculation and Preparation of Diet for Adulthood- Male and Female.
3. Planning, Calculation and Preparation of Diet for physiological condition Pregnancy.
4. Planning, Calculation and Preparation of Diet for physiological condition Lactation.
5. Planning, Calculation and Preparation of Diet for Infancy -Weaning Mix.
6. Planning, Calculation and Preparation of Diet for Preschoolers.
7. Planning, Calculation and Preparation of Diet for School Going Child- Packed Lunch.
8. Planning, Calculation and Preparation of Diet for Adolescence- Boy and Girl.
9. Planning, Calculation and Preparation of Diet for Geriatrics.
10. Planning, Calculation and Preparation of Diet for Fevers- typhoid, tuberculosis.

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Longvah T., Ananthan R., Bhaskarachary K. and Venkaiah K. Indian Food Composition Table, National Institute of Nutrition, Tarnaka, 2017.
3. Indian Dietetic Association, Clinical Dietetics Manual 2nd Edition

COURSE OUTCOMES:

At the end of the course students will be able to:

ND336P.CO1 Prepare diets according to the RDA for different age groups.
ND336P.CO2 Implement the diet plan in preparation of diet in diseases.

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(Academic year 2023-24)

COURSE NAME: NUTRACEUTICALS, FUNCTIONAL & NOVEL FOODS

PAPER CODE: SE336A **PPW: 2**
YEAR/SEMESTER: II/III **NO. OF CREDITS: 2**

COURSE OBJECTIVE: To acquire knowledge about the importance of nutraceuticals, functional and novel foods.

UNIT-WISE COURSE OBJECTIVES:

COb1 To acquire knowledge related to food supplements and other foods.
COb2 To isolate and identify different nutrients from food samples and prepare functional foods.

UNIT I

1. Nutraceuticals – definition, types, classification & significance and role as bioactive compounds and antioxidants.
2. Prebiotics and Probiotics-definition, types, common food sources, fermented and nonfermented probiotics, role of probiotics and prebiotics as nutraceuticals
3. Functional foods - definition, types, common food sources, and their health benefits.
4. Novel foods – introduction, definition and types, novel food protein, leaf protein, chlorella and spirulina.
5. Use of nutraceuticals, functional and novel foods as food supplements.

UNIT II

1. Estimation of bioactive compounds & antioxidants from food samples (saponins, terpenoids, tannins, phenolics).
2. Fractionation of proteins from food samples (milk, soya milk etc.).
3. Isolation of gluten from food sample.
4. Survey on nutraceutical, functional and novel foods in the market.
5. Preparation of functional foods rich in nutrients like proteins, vitamins, minerals, antioxidants, etc.

REFERENCES:

1. Srilakshmi B – Nutrition Science, 7th edition, New Age International publishers, 2002.
2. Robert E.C. Wildman – Handbook of Nutraceuticals and Functional foods., CRC Press, 2001.

COURSE OUTCOMES:

At the end of the course students will be able to:

SE336A.CO1 Implement the knowledge of the nutraceuticals, functional and novel foods in day-to-day diets.
SE336A.CO2 Execute the preparation of functional foods and nutraceuticals in food industries.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2023-24)

COURSE NAME: DIET IN DISEASE

PAPER CODE: ND436 **PPW: 4**
YEAR/SEMESTER: II/IV **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To gain knowledge about weight management and plan special diets in diseases.

UNIT-WISE COURSE OBJECTIVES:

COb1 To discuss energy metabolism and diet management in underweight and obesity.
COb2 To explain the dietary modifications in diabetes and cardiovascular diseases.
COb3 To elaborate upon disorders of gastrointestinal diseases and their dietary modifications.
COb4 To acquire knowledge of liver and biliary disorders and dietary management.

UNIT I: ENERGY METABOLISM **15 hours**

1. Energy metabolism- Measurement of energy by direct and indirect calorimetry, determination of energy value of food by bomb calorimeter and Benedict's oxy calorimeter
2. Energy balance, Factors affecting TEE - BMR, Physical Activity, SDA.
3. Underweight- Definition, Causes, Principles of the Diet, Dietary Modifications, Foods to be included and avoided.
4. Obesity - Definition, Causes, Assessment (BMI, Body Weight, Broca's Index), Types (Grade I, II, II, Apple and Pear shape) Complications, metabolic syndrome, Principles of the Diet, Dietary Modifications, Foods to Be Included and avoided

UNIT II: DIET IN DIABETES AND CARDIO VASCULAR DISEASES **15 hours**

1. Diabetes - Definition, Causes, Types, T1DM -Risk factors, Signs, Symptoms, Complications and Dietary Modifications
2. T2DM- risk factors, Signs, Symptoms, Complications and Dietary Modifications.
3. Circulatory system- Parts & functions of heart, heart rate, cardiac cycle, cardiac output; blood pressure.
4. Hypertension- Definition, Causes, Types, Risk factors, Signs, Symptoms, Complications and Dietary Modifications
5. Atherosclerosis and Hyperlipidaemia - Definition, Causes, Risk factors, Signs, Symptoms, Complications and Dietary Modifications

28/9/23

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UNIT III: DIET IN GASTRO – INTESTINAL DISEASES **15 hours**

1. Digestive system- Parts and functions of GI tract, digestive glands, digestion, absorption and transport of proteins, lipids and carbohydrates.
2. Diarrhoea - Definition, causes, types, symptoms, complications and dietary modifications, foods to be included and avoided
3. Constipation - Definition, causes, types, symptoms, complications and dietary modifications, foods to be included and avoided
4. Peptic Ulcer - Definition, causes, types, symptoms, complications and dietary modifications, foods to be included and avoided
5. Other GI disorders - Celiac disease, inflammatory bowel disease (ulcerative colitis, Crohn's and short gut syndrome)- Definition, Symptoms

UNIT IV: DIET IN LIVER AND BILIARY DISORDERS **15 hours**

1. Hepatitis - Definition, Causes, Types, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.
2. NAFLD (Non-Alcoholic Fatty Liver Disease) - Definition, Causes, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.
3. Cirrhosis - Definition, Causes, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.
4. Gallstones - Definition, Causes, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.
5. Pancreatitis - Definition, Causes, Types, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND436.CO1 Interpret and implement the knowledge of energy metabolism in underweight and obesity management.
ND436.CO2 Formulate diets for diabetes and cardiovascular disorders.
ND436.CO3 Apply the knowledge in suggesting dietary modifications for various gastrointestinal disorders.
ND436.CO4 Implement the dietary modifications in liver and biliary disorders.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2023-24)

COURSE NAME: DIET IN DISEASE

PAPER CODE: ND436P **PPW: 3**
YEAR/SEMESTER: II/IV **NO. OF CREDITS: 1**

COURSE OBJECTIVE:

COb1 To familiarize students in planning, calculating, and preparing diets for weight abnormalities, diabetes and hypertension.
COb2 To train in planning, calculating and preparing diets for gastrointestinal, liver and biliary disorders.

Planning, Calculation and Preparation of Diets for

1. Underweight
2. Obesity
3. Diabetes- T2DM
4. Hypertension
5. Diarrhoea
6. Constipation
7. Peptic Ulcer
8. Hepatitis
9. Cirrhosis
10. Pancreatitis

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Longvah T., Ananthan R., Bhaskarachary K. and Venkaiah K. Indian Food Composition Table, National Institute of Nutrition, Tarnaka, 2017.
3. Indian Dietetic Association, Clinical Dietetics Manual 2nd Edition

COURSE OUTCOMES:

At the end of the course students will be able to:
ND436P.CO1 Identify and implement the intricacies of diet planning for underweight, obesity, diabetes and hypertension.
ND436P.CO2 Implement the knowledge in diet planning for gastrointestinal, liver and biliary disorders.

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(Academic year 2023-24)

COURSE NAME: STRATEGIES FOR WEIGHT MANAGEMENT

PAPER CODE: SE436A **PPW: 2**
YEAR/SEMESTER: II/IV **NO. OF CREDITS: 2**

COURSE OBJECTIVE: To discuss the role of nutrition in weight management

UNIT-WISE COURSE OBJECTIVES:

COb1 To explain various strategies in determining and managing weight gain.
COb2 To discuss diets for weight loss.

UNIT I: STRATEGIES FOR WEIGHT MANAGEMENT 15 hours

1. Assessment of weight – anthropometry, body composition, Concept of BMI.
2. Determination of Energy needs and Factors affecting fuel utilization (lifestyle, hormonal and evaluation of physical activity issues)
3. Strategies for weight loss and weight maintenance – Diet therapy and types of physical activity. Role of yoga in weight maintenance.
4. Stress management, Pharmacotherapy, Weight loss surgery

UNIT II: DIETS FOR WEIGHT LOSS 15 hours

1. Translating RDA into Daily food intake, guidelines for planning weight managing diets.
2. VLCD (Very low calorie diet) precautions and complications, General Motor's Weight loss program, commercial meal supplements.
3. Low Carbohydrate Diets: Atkins Diet, Zone diet and South beach Diet - precautions and complications.
4. Ketogenic diet and Intermittent Fasting- precautions and complications.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: CLINICAL DIETETICS

PAPER CODE: ND536 **PPW: 4**

YEAR/SEMESTER: III/V **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To equip students with the knowledge of dietary management for different conditions.

UNIT-WISE COURSE OBJECTIVES:

COb1 To illustrate diet modifications in critically ill patients.
COb2 To interpret the effect of nutrition in stress.
COb3 To relate the dietary management in renal disorders.
COb4 To discuss dietary modifications in specific conditions.

UNIT I: NUTRITION IN CRITICAL ILLNESS **15 Hours**

1. Introduction and MNT in critically ill.
2. Special feeding methods- Enteral feeding - Modes, methods, choice of formula, indications and complications, blenderized feeding.
3. Parenteral feeding - Modes, choice of formula, indications and complications.
4. Immunonutrition- Definition, immune nutrients and their role in enhancing immunity.

UNIT II: NUTRITION IN STRESS **15 hours**

1. Nutrition in surgery –physiological response, preoperative and postoperative nutrition care, refeeding syndrome.
2. Sepsis - Definition, Causes, Complications and Dietary Modifications.
3. Trauma - Definition, physiological response and Dietary Modifications.
4. Burns- Introduction, Rules of Nine, Metabolic changes, Medical Nutritional therapy.

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UNIT III: NUTRITION IN RENAL DISORDERS **15 hours**

1. Excretory system - Urinary system –parts and functions, structure of nephron, formation of urine
2. Nephritis and nephrosis- Definition, causes, symptoms, principles of the diet and dietary modifications, foods to be included and avoided.
3. Renal Failure - Definition, types (acute and chronic) risk causes, symptoms, principles of the diet and dietary modifications, foods to be included and avoided.
4. Dialysis- Introduction, types, principles of the diet and dietary modifications, foods to be included and avoided.
5. Renal Calculi- Definition, causes, types, symptoms, principles of the diet and dietary modifications (acid ash, alkaline ash and low oxalate), foods to be included and avoided.

UNIT IV: NUTRITION IN OTHER CONDITIONS **15 hours**

1. COPD (Chronic Obstructive Pulmonary Disease)- Definition, causes, symptoms, and dietary modifications,
2. PCOD (Polycystic Ovarian Disease) – Definition, signs and symptoms, risk factors and complications and Dietary Management.
3. Nutrition in neurological disorders (Parkinsonism, Alzheimer's disease, dysphagia, epilepsy).
4. Cancer - Definition, Types, stages of cancer, risk factors, Symptoms, Complications and Dietary Modifications, treatment options, Prevention of cancer

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002. Reference Books
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND536.CO1 Plan varied diets for critical care conditions.
ND536.CO2 Develop the diets for stress conditions.
ND536.CO3 Relate the dietary modifications for various renal disorders.
ND536.CO4 Plan suitable diets for specific conditions.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: CLINICAL DIETETICS

PAPER CODE: ND536P **PPW: 2**
YEAR/SEMESTER: III/V **NO. OF CREDITS: 1**

COURSE OBJECTIVE:

COb1 To relate the students with planning, calculation and preparation of diets for cases of critical care.
COb2 To illustrate to the students in planning and preparation of diets in specific diseases.

Plan and calculate the nutritive values and prepare diets for the following diseases.

1. Pre and postoperative condition
2. Burns
3. Tube feeding (kitchen and formula feeds)
4. PCOD
5. Cancer
6. Nephrotic syndrome
7. CKD on and off Dialysis
8. A Market Survey on Dietary Supplementary formulas and TPN formulas - composition, brand names and nutrient content (for specific diseases).

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. LongvahT., Ananthan R. ,Bhaskarachary K. and Venkaiah K. Indian Food Composition Tables, National Institute of Nutrition, Tarnaka, 2017.
3. Indian Dietetic Association, Clinical Dietetics Manual 2nd Edition

COURSE OUTCOMES:

At the end of the course students will be able to:

ND536P.CO1 Prepare diets according to specific requirements of critical care patients.
ND536P.CO2 Relate the modifications of diet plan to specific conditions.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: DIET THERAPY

PAPER CODE: ND536A **PPW: 4**

YEAR/SEMESTER: III/V **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To equip students with the knowledge of dietary management for different diseases.

UNIT-WISE COURSE OBJECTIVES:

CObj1 To explain the dietary management in renal disorders.
CObj2 To discuss dietary modifications in specific conditions.
CObj3 To familiarize gene expression and nutrigenomics.
CObj4 To introduce immunonutrition.

UNIT I: DIET IN RENAL DISEASE 15 hours

1. Nephritis- Definition, causes, symptoms, principles of the diet and dietary modifications, foods to be included and foods to be avoided.
2. Nephrosis- Definition, causes, symptoms, principles of the diet and dietary modifications, foods to be included and foods to be avoided.
3. Renal Failure - Definition, types (acute and chronic) risk causes, symptoms, principles of the diet and dietary modifications, foods to be included and foods to be avoided.
4. Renal Calculi- Definition, causes, types, symptoms, principles of the diet and dietary modifications (acid ash, alkaline ash and low oxalate), foods to be included and foods to be avoided

UNIT II: DIET THERAPY IN OTHER CONDITIONS 15 hours

1. Arthritis - Definition, causes, types, symptoms, and dietary modifications, foods to be included and avoided.
2. Bronchitis- Definition, causes, symptoms and dietary modifications foods to be included and avoided.
3. PCOS – Definition, signs and symptoms, risk factors and complications and Dietary Management.
4. Cancer - Definition, Types, risk factors, Symptoms, Complications and Dietary Modifications, foods to be included and avoided.

UNIT III: NUTRITIONAL REGULATION OF GENE EXPRESSION & NUTRIGENOMICS **15 hours**

1. Introduction to Gene Expression. Role of specific nutrients in controlling gene expression.
2. Influence of macronutrients on the regulation of gene expression.
3. Influence of micronutrients on the regulation of gene expression
4. Influence of Fibre and microflora on the regulation of gene expression.

UNIT IV: IMMUNONUTRITION **15 hours**

1. Definition, Classification. Role of specific nutrients in immune suppression.
2. Role of nutrients in immune promotion.
3. Functional foods and nutraceuticals in health and disease.
4. Physiological effects, effects on human health and potential applications in risk reduction of diseases

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.
5. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils.
6. Alfred H. Katz, Prevention and Health, the Haworth Press, New York 1999.
7. Nutritional Biochemistry of Vitamins David A. Bendor.
8. 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.
9. Williams S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
10. Thomas, B.: Manual of Dietetic Practice, 1996.
11. L. MatareseGottschlich Contemporary Nutrition Support Practice, Saunders 1996

COURSE OUTCOMES:

At the end of the course students will be able to:

ND536A.CO1 Modify the diet for patients with renal disorders.
ND536A.CO2 Develop diets for specific conditions.
ND536A.CO3 Relate the influence of nutrition on gene expression.
ND536A.CO4 Choose relevant foods to improve immunity.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: DIET THERAPY

PAPER CODE: ND536AP **PPW: 2**
YEAR/SEMESTER: III/V **NO. OF CREDITS: 1**

COURSE OBJECTIVE:

COb1 To familiarize the students with planning, calculation and preparation of diets for various renal and other disorders.
COb2 To interpret the usage of various dietary supplements.

I Plan, calculate the nutritive values and prepare diets for the following diseases.

1. Nephrotic syndrome
2. Chronic Renal Disease.
3. CKD in Hemodialysis
4. Renal stones
5. PCOS.
6. Cancer.

II Market Survey on Dietary Supplements

7. A Market Survey on immunity boosting dietary supplements commonly available. Their composition, brand names, nutrient content, and portion size.
8. A Market Survey on dietary supplements formula feeds commonly available. Their composition, brand names, nutrient content, and portion size.
9. A Market Survey on metabolite dietary supplements commonly available. Their composition, brand names, metabolite content, and portion size.

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002.
2. Longvah T., Ananthan R., Bhaskarachary K. and Venkaiah K. Indian Food Composition Table, National Institute of Nutrition, Tarnaka, 2017.
3. Indian Dietetic Association, Clinical Dietetics Manual 2nd Edition

COURSE OUTCOMES:

At the end of the course students will be able to:
ND536AP.CO1 Implement dietary modifications for renal diseases and other specific conditions.
ND536AP.CO2 Assess the significance and utilization of dietary supplements.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: NUTRITION AND HEALTH

PAPER CODE: GE536 **PPW: 4**
YEAR/SEMESTER: III/V **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To create and spread awareness about the importance of nutrition in health, wellbeing and fitness.

UNIT-WISE COURSE OBJECTIVES:

COb1 To explain students the basic concepts of nutrition.
COb2 To correlate the interdependence of diet, health and fitness.
COB3 To explain dietary modifications of nutrients in diseases.
COb4 To familiarize the students with the basic knowledge of food standards and safety

UNIT I: BASIC CONCEPTS OF NUTRITION **15 hours**

1. Definition of terms- Food, Nutrition and Nutrients, Functions of Food and Nutrients in general.
2. ICMR - Basic food groups and their functions, Food Pyramid, Balanced diet – definition and its importance, my Plate, RDA.
3. Inter-relationship between nutrition and health-visible symptoms of good health.
4. Methods of cooking – Moist heat, Dry heat and Combination methods. Effects of cooking on nutritive value of foods and methods to improve nutritional quality of foods.

UNIT II: CONCEPT OF HEALTH AND FITNESS **15 hours**

1. Definition of health, exercise and physical fitness and their interrelationship, dimensions of health and fitness - a holistic approach (physical, psychological, emotional and spiritual)
2. BMI, Energy Balance, input and output.
3. Role of nutrition in health and fitness, effect of specific nutrients on work performance and physical fitness.
4. Guidelines of physical activity, physical activity pyramid and its significance, diet and exercise for weight management.

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UNIT III: DIET IN THERAPY 15 hours

1. Importance of Nutritional supplements and Functional foods (carbohydrate based functional foods, functional proteins and functional lipids) to support health.
2. Indications of dietary modification and their importance.
3. Foods to be included and avoided for Liquid and Soft diet
4. Nutrient modification of diets and their importance, foods to be included and avoided. High and Low-calorie diet, High and Low protein diet, High and low fibre diet, High and Low-fat diet and Low sodium diet

UNIT IV: BASICS OF FOOD SAFETY 15 hours

1. Definition of food, classification of foods based on perishability, selection of foods-packaged and non-packaged foods.
2. Introduction to food labelling and its significance and standards.
3. Types of food and nutrition labels, labelling regulation, barcode, health claims, essential commodities act (FPO, MFPO, MMPO)
4. Role of food regulatory body – FSSAI (Food Safety and Standards Authority of India), Detection of food adulteration -DART (Detect Adulteration with Rapid Test).

REFERENCES:

1. Sumati R. Mudambi - Fundamentals of Foods,Nutrition and Diet therapy,6th Edition, New Age International Publishers, New Delhi.
2. Srilakshmi B- Food Science, 5th Edition, New Age International Publishers, New Delhi – 110002, 2011.
3. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002. Reference Books.
4. DART- Detect Adulteration with Rapid Test, FSSAI, Ministry of Health and Family Welfare, Government of India.
5. Roday, Sunetra., Food Hygiene and Sanitation; Tata McGraw Hill, 2nd edition, 2017.

COURSE OUTCOMES:

At the end of the course students will be able to:

GE536.CO1 Implement the nutritional concepts in daily life.
GE536.CO2 Apply the interrelations of diet, health and fitness as a routine.
GE536.CO3 To plan diets based on nutrient specificity.
GE536.CO4 Interpret and implement the knowledge of food labels and food safety in day to day life.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: PUBLIC HEALTH AND FOOD TECHNOLOGY

PAPER CODE: ND636 **PPW: 4**
YEAR/SEMESTER: III/VI **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To make students aware of the importance and scope of public health in relation to communicable diseases in India.

UNIT-WISE COURSE OBJECTIVES:

COb1 To determine the nutritional assessment of individuals using various techniques.
COb2 To health education and ways to combat malnutrition
COb3 To familiarize students the effect of epidemic and communicable diseases and their control.
COb4 To familiarize the students with latest trends in food technology and standards at national and international levels.

UNIT I: METHODS TO ASSESS NUTRITIONAL STATUS 15 hours

1. Nutritional Status – Definition, objectives and methods of assessment (direct & indirect). Anthropometry – Height, Weight, BMI, Height / Weight, Height / Age, Weight/ Age, Head and Chest Circumference, Mid Upper Arm Circumference and Skinfold Thickness, CIAF(Composite Index of Anthropometry Failure)
2. Biochemical Assessment – Assessment of nutritional status using various parameters in blood, urine and stool tests.
3. Clinical Assessment – Signs and Symptoms of Malnutrition, Classification of Clinical Signs and Symptoms used in Nutritional Surveys.
4. Diet Surveys – individual, family, community - Food Balance Sheet Method, Inventory method, Weighment Method, Expenditure Pattern, Oral Questionnaire Method, Duplicate Sample, Dietary score and Recording Method, 24-Hour diet recall method food frequency questionnaire.

UNIT II: HEALTH EDUCATION AND PRIMARY HEALTH CARE 15 hours

1. Health education – Aims, Objectives, Approaches, Content and Principles of health education, role of public nutrition in improving health.
2. Practice of Health Education –Audio Visual Aids, Methods in Health Communication – Individual, Group and Mass Approach.

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3. Primary Health Care System- Definition, functioning, health indicators of mortality and morbidity (Infant & Maternal).
4. Strategies to combat malnutrition- Supplementary feeding programs (SNP, ICDS, MDM, fortification, enrichment) and prophylaxis programs (Anaemia prophylaxis, Vitamin A prophylaxis and NIDDCP)
5. Role of International organizations to combat malnutrition- UNICEF, FAO, WHO, CARE and National agencies – ICMR, ICAR, NIN, NNMB, CFTRI.

UNIT III: EPIDEMIOLOGY OF COMMUNICABLE DISEASES AND FOOD BORNE DISEASES **15 hours**

1. Epidemiology- Definition, Aim, Approach, Measurement- Mortality and Morbidity
2. Epidemiologic methods: Descriptive studies, Analytical studies (Ecological, Observational Cross-Sectional, Case-Control and Cohort). Experimental and Interventional studies – (Random Controlled trials, field trials and Community intervention trials) Uses of epidemiology.
3. Communicable Diseases: Causes, Symptoms, Treatment and Control Measures of Measles, Mumps, Pneumonia, Diphtheria, Cholera and Dengue and SARS, herpis COVID-19, chicken pox.
4. Food Borne Illness- Classification, Food Poisoning or Intoxication – Bacterial food Poisoning-Staphylococcus, Botulism and Bacillus Cereus food poisoning and their control.
5. Food Infections- Bacterial food infections- Salmonellosis, Typhoid, Shigellosis, Cholera, Enteropathogenic infection and Fungal Contamination, (mycotoxin consumption in general) Parasitic Infestation, Control of Food Borne Illnesses.

UNIT IV: FOOD TECHNOLOGY AND FOOD STANDARDS **15 hours**

1. Food Technology- Introduction, types, relevance to the modern day, Introduction to dairy technology, fermentation technology and Hurdle technology.
2. Food preservation – principles, traditional methods- curing, freezing, canning, boiling, pickling; modern techniques- pasteurization, freeze drying, vaccum packing, irradiation, pascalization, Space foods. Bio preservatives and chemical preservatives.
3. Food Adulteration- intentional and incidental, food adulterants- types and hazards, DART, and Food additives; Food packaging, types of packing and Nutrition labelling.
4. Food standards and regulations- GHP (Good Hygiene Practices), GMP (Good Manufacturing Practices) and TQM (Total Quality management) in food industry, significance of standards and regulatory bodies, National and international regulatory bodies (HACCP, FSSAI, PFA, ISO, Codex Alimentarius), Future of food industry- Scope, Challenges and limitations.

REFERENCES:

1. Srilakshmi B -Nutrition Science, 5th edition, New Age International publishers, 2002.
2. Suryatapa Das – Textbook of Community Nutrition, 3rd Edition, Academic publishers,Kolkata, 2018.
3. Swaminathan N - A Handbook of Food and Nutrition, 5th edition volume 1, Bangalore printing and publishing Co.Ltd, 1986.
4. Park K - Text book of Preventive and Social Medicine 19th edition, BanarsidasBhanot Publishers. Jabalpur, India, 2007.
5. Fraizer. W., Food Microbiology, McGraw-Hill co Ltd., New Delhi. 2005.

6. Adams M, R and Moss M. O., Food Microbiology, New Age International (P) Ltd., New Delhi, 2005.
7. Syed Imran Hashmi & Rahul Eknath kamble - Basics of Food Technology, Foodkida Inc. Pune, Maharastra, 2023

COURSE OUTCOMES:

At the end of the course students will be able to:

ND636.CO1 Asses the nutritional status of individuals
ND636.CO2 Implement various health education methods to control malnutrition.
ND636.CO3 Interpret control measures of epidemic and communicable diseases.
ND636.CO4 Apply the technological aspects of food processing and regulations in food industries.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: PUBLIC HEALTH AND FOOD TECHNOLOGY

PAPER CODE: ND636P **PPW: 2**
YEAR/SEMESTER: III/VI **NO. OF CREDITS: 1**

COURSE OBJECTIVE:

COb1 To explain the different assessment methods to evaluate the nutritional status of individuals.
COb2 To discuss the significance of visual aids to impart health education and survey methods and detection of adulteration.

1. Assessment of Nutritional Status by Anthropometry for preschooler -height, weight, MUAC, and growth charts for different stages (infancy to adolescents).
2. Assessment of Nutritional Status by Anthropometry for adolescent girl, BMI growth charts and waist circumference.
3. Assessment of Nutritional Status by Clinical Methods- Signs & Symptoms.
4. Biochemical assessment of nutritional status.
5. Diet counselling to the target group/individual.
6. Using a food frequency questionnaire and 24-hour dietary recall assess the Nutritional Status of individuals.
7. Consolidation of Data Collected and Report on the Survey conducted.
8. Preparation of Visual Aids to impart health education.
9. Field visit to observe the working of nutrition and health-oriented programmes (survey-based result).
10. Conduct of a Nutritional Education Program on Nutrition labelling and Food regulations (School/ college/ local communities).
11. Detection of Adulterants - milk, ghee and butter, spices

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002. Reference Books
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.

5. Menus for Low-Cost Balanced Diets and School Lunch Programmes (Suitable for North Indians, ICMR-NIN, Tarnaka, Hyderabad.
6. Dietary Guidelines for Indians -A Manual, ICMR-NIN, Tarnaka, Hyderabad.
7. Low-Cost Nutritious Supplements (LCNS – T), ICMR-NIN, Tarnaka, Hyderabad.

COURSE OUTCOMES:
At the end of the course students will be able to:

ND636P.CO1 Apply assessment methods to understand nutritional status of the common public.
ND636P.CO2 Prepare visual aids to impart nutritional education and detect adulterants in food samples.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: COMMUNITY NUTRITION

PAPER CODE: ND636A **PPW: 4**
YEAR/SEMESTER: III/VI **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To ascertain the major concepts of nutritional assessment and health education.

UNIT-WISE COURSE OBJECTIVES:

CObl To familiarize the students with community health education.
COb2 To discuss the nutritional assessment of individuals.
COb3 To explain the malnutrition related issues.
COb4 To familiarize the strategies to combat malnutrition.

UNIT I: COMMUNITY AND HEALTH EDUCATION 15 hours

1. Community- Definition, Characteristics, types, Characteristics of rural and urban communities, Community nutrition and its activities.
2. Community health: Factors affecting community health- Demographic factors, Health factors, Social factors, Cultural and religious factors, Practical and administrative factors, Geographical, climatic and environmental factors, and Nutritional factors.
3. Health education – Aims, Objectives, Approaches, Content and Principles of health education
4. Practice of Health Education –Audio Visual Aids, Methods in Health Communication – Individual, Group and Mass Approach

UNIT II: ASSESSMENT OF NUTRITIONAL STATUS 15 hours

1. Nutritional status- Definition, Nutritional assessment, Goal, aim and objectives of nutritional status, Methods of nutritional assessment: Indirect methods –Vital statistics, Ecological factors.
2. Direct Methods- ABCD analysis, Nutritional Anthropometry- Height, Weight, BMI, Height / Weight, Height / Age, Weight/ Age, Head and Chest Circumference, Mid Upper Arm Circumference and Skinfold Thickness, Application of nutritional anthropometry and use of growth charts.
3. Biochemical and Clinical Assessment – Assessment of nutritional status using various parameters in blood, urine, and stool tests. Clinical- Signs and Symptoms of Malnutrition, Classification of Clinical Signs and Symptoms used in Nutritional Surveys.

4. Diet Surveys: Individual, family, community based- Food Balance Sheet Method, Inventory method, Weighment Method, Expenditure Pattern, Oral Questionnaire Method, Duplicate Sample, Dietary score and Recording Method, 24-Hour diet recall method food frequency questionnaire.

UNIT III: MALNUTRITION AND NUTRITIONAL DISORDERS **15 hours**

1. Malnutrition- Types, Prevalence, under and over nutrition, etiology and consequences.
2. Indicators of malnutrition- Macro, Meso and Micro indicators, malnutrition in different age groups and vulnerable groups.
3. PEM, Nutritional Anaemia, Vitamin A deficiency, childhood obesity.
4. Iodine deficiency disorders, Fluorosis.

UNIT IV: HEALTH ADMINISTRATION AND STRATEGIES TO COMBAT NUTRITIONAL PROBLEMS **15 hours**

1. Health Administration – Centre level, State level, Village level and Primary health care.
2. Supplementary Feeding programs to combat malnutrition – ICDS (Adolescents, pregnant and lactating mothers), MDM, fortification (single and double) and enrichment of foods.
3. Prevention of malnutrition- Family level, Community level, National level and International level. Nutrient Deficiency control programs- Nutritional anaemia prophylaxis programme, Prophylaxis programme against Vitamin A deficiency.
4. NIDDCP-National Iodine deficiency disorder control programme.
5. Role of International organizations to combat malnutrition- UNICEF, FAO, WHO, CARE and National agencies – ICMR, ICAR, NIN, NNMB, CFTRI.

REFERENCES:

1. Srilakshmi B -Nutrition Science, 5th edition, New Age International publishers, 2002.
2. Park K - Text book of Preventive and Social Medicine 19th edition, Banarsidas Bhanot Publishers. Jabalpur, India, 2007.
3. Suryatapa Das – Textbook of Community Nutrition, 3rd Edition, Academic publishers, Kolkata, 2018.
4. Jelliffe D (1966) The assessment of Nutritional status of the community. Geneva. WHO.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND636A.CO1 Apply the various methods of community health education.
ND636A.CO2 Assess the nutritional status of individuals using various techniques.
ND636A.CO3 Analyse and understand the various disorders related to malnutrition.
ND636A.CO4 Implement the strategies to combat malnutrition.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: COMMUNITY NUTRITION

PAPER CODE: ND636AP **PPW: 2**
YEAR/SEMESTER: III/VI **NO. OF CREDITS: 1**

COURSE OBJECTIVE:

COb1 To discuss the planning of low-cost nutritious diets and prepare visual aids to impart nutritional health education.
COb2 To explain the different assessment methods to evaluate the nutritional status of individuals.

1. Assessment of Nutritional Status by Anthropometry for a preschool height, weight, MUAC, and growth charts for different stages (infancy to adolescents).
2. Assessment of Nutritional Status by Anthropometry for adolescent girl, BMI growth charts and waist circumference.
3. Assessment of Nutritional Status by Clinical Methods- Signs & Symptoms.
4. Biochemical assessment of nutritional status.
5. Using a food frequency questionnaire and 24-hour dietary recall assess the Nutritional Status of individuals.
6. Consolidation of Data Collected and Report on the Survey conducted.
7. Preparation of Visual Aids to impart health education.
8. Field visit to observe the working of nutrition and health-oriented programmes (survey-based result).
9. Conduct of a Nutritional Education Program (School/ college/ local communities).

REFERENCES:

1. Srilakshmi B – Dietetics, 5th edition, New Age International publishers, 2002. Reference Books
2. Antia F.P - Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 2003.
3. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 2nd edition, Oxford and IBH publishing Co. Pvt. Ltd, 2004.
4. Swaminathan, M - Essentials of Food and Nutrition, Vol 2, Bangalore Printing and Publishers Co Ltd, Bangalore, 1985.
5. Low-Cost Nutritious Supplements, ICMR-NIN, Tarnaka, Hyderabad

6. Menus for Low-Cost Balanced Diets and School Lunch Programmes (Suitable for South Indians), ICMR-NIN, Tarnaka, Hyderabad.
7. Menus for Low-Cost Balanced Diets and School Lunch Programmes (Suitable for North Indians, ICMR-NIN, Tarnaka, Hyderabad.
8. Dietary Guidelines for Indians -A Manual, ICMR-NIN, Tarnaka, Hyderabad.
9. Low-Cost Nutritious Supplements (LCNS – T), ICMR-NIN, Tarnaka, Hyderabad.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND636AP.CO1 Prepare health education aids and plan low-cost nutritious recipes to educate common public.
ND636AP.CO2 Apply assessment methods to understand nutritional status of the community.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2024-25)

COURSE NAME: FOOD SANITATION AND HYGIENE (THEORY)

PAPER CODE: ND636_O **PPW: 4**

YEAR/SEMESTER: III/VI **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To elaborate on the significance on food sanitation and hygiene.

UNIT-WISE COURSE OBJECTIVES:

COb1 To familiarize the students with complications of food hazards
COb2 To explain food contamination, spoilage and communicable diseases.
COb3 To familiarize with the personal hygiene aspects of the food handlers.
COb4 To discuss the importance of sanitation in food industry and disposal of waste.

UNIT I: FOOD HAZARDS **15 hours**

1. The relationship of microorganisms to sanitation.
2. Environmental effects of microbial growth.
3. Effects of microbes on food degradation and food borne illnesses (bacteria, viruses, molds, yeasts and parasites).
4. Other food hazards – Chemicals, antibiotics, hormones and metal contamination.

UNIT II: FOOD CONTAMINATION, FOOD BORNE ILNESS AND INFECTIONS, AND COMMUNICABLE DISEASES **15 hours**

1. Food contamination - sources and transmissions.
2. Agents of contamination – microbes, humans, animals, vermin.
3. Food Borne Illness- Classification, Food Poisoning or Intoxication – Bacterial food Poisoning-Staphylococcus, Botulism and Bacillus Cereus food poisoning.
4. Food Infections- Bacterial food infections- Salmonellosis, Typhoid, Shigellosis, Cholera, Enteropatheogenic infection and Fungal Contamination, (mycotoxin consumption in general) Parasitic Infestation.
5. Communicable Diseases: Causes, Symptoms, Treatment and Control Measures of Diphtheria, Cholera, chicken pox and Dengue and SARS, COVID-19.

UNIT III: IMPORTANCE OF PERSONAL HYGIENE OF FOOD HANDLERS

15 hours

1. General principles of hygiene – Personal and environmental hygiene.
2. Hygienic practices in handling and serving foods.
3. Importance of personal hygiene of food handler habits, clothes and illness.
4. Education of food handler in handling and serving food, sterilization and disinfection.

UNIT IV: SANITATION IN FOOD INDUSTRY

15 hours

1. Standards for non-vegetarian and vegetarian foods and water quality.
2. Cleaning and sanitation – Need for efficient cleaning program, cleaning agents and equipments. Methods of cleaning – methods to wash, rinse and sanitizing food contact surfaces.
3. Control of spoilage and infestations- safety of leftover foods, Rodent control (rats, mice, rodent proofing), vector control and use of pesticides.
4. Waste product handling – Planning for waste disposal. Methods of waste disposal – Liquid, solid and gaseous waste disposal.

REFERENCES:

1. Fraizer. W., Food Microbiology, McGraw-Hill co Ltd., New Delhi. 2005.
2. Adams M, R and Moss M. O., Food Microbiology, New Age International (P) Ltd., New Delhi, 2005.
3. Roday, Sunetra., Food Hygiene and Sanitation; Tata McGraw Hill, 2nd edition, 2017.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND636_O.CO1 Analyze and understand the hazards related to food.
ND636_O.CO2 Assume the adverse effects related food contamination, food borne illness and infection and communicable diseases.
ND636_O.CO3 Implement the standards of personal hygiene.
ND636_O.CO4 Explain the significance of sanitation and waste disposal in food industry.

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PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
Choice Based Credit System (CBCS Syllabus)
(Academic year 2024-25)

PROJECT WORK

PAPER CODE: ND636_PW **PPW: 4**

YEAR/SEMESTER: III/VI **NO. OF CREDITS: 4**

COURSE OBJECTIVE

Cob 1: To select a research topic and execute the planned work using appropriate methodology.

Cob 2: To organize the completed work in the form of project dissertation and submit.

1. Project work will involve experimental work/data collection and it has to be completed in the stipulated time by the student.
2. Students will be asked their choice for Project work at the beginning of Semester VI and all formalities of topic and mentor selection will be completed. Project work will be offered as per the expertise and infrastructural facilities available in the department.
3. Project work may be allotted to students as individual or as group project (not exceeding 5 students per group).
4. The completed work and compiled data would be presented in the form of results and submitted in the form of a dissertation/project report.
5. Final evaluation of the project work will be through a panel consisting of internal and external examiners.
6. Guidelines provided for execution and evaluation of project work would be strictly adhered.
7. The grading would be based on evaluation of punctuality, experimental work, record keeping, academic inputs, data presentation, interpretation etc.

Basic concepts of Project planning

a. Selection of Project topic and defining objectives
b. Planning of methods/approaches

Guidelines for Project writing

- Title of the Project, Name of the Student & Supervisor
- Declaration by the Student & Supervisor
- Objectives of the project
- Introduction & Review of Literature
- Methodology

- Results and Discussion
- Conclusion
- References

Course Outcome

At the end of the course, students will be able to

ND636_PW.CO1: Plan and execute the project effectively in the stipulated time period.
ND636_PW.CO2: Develop analytical skills, statistical data handling skills, paper writing and oral presentation skills.

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